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surgical journal*

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Per. 15084 e. 82

THE
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MEDICAL AND SURGICAL
JOURNAL:
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OF THE
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IN
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No. CLIV.

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The following works have been received :—

A Practical Treatise on the Human Teeth : showing the Causes of their Destruction and the means of their Preservation. With Plates. By William Robertson. Third Edition. London, 1842. 8vo. Pp. 224.

Chemistry of Animal Bodies. By Thomas Thomson, M.D., Regius Professor of Chemistry in the University of Glasgow, &c. Edinburgh, 1843. 8vo. Pp. 702.

Manual of Diseases of the Skin. From the French of MM. Cazenave and Schedel, with Notes and Additions by Thomas H. Burgess, M. D., &c. London, 1842. 12mo. Pp. 320.

Food and its Influence on Health and Disease : or an Account of the effects of different kinds of Aliment on the Human Body, with Dietetic Rules for the Preservation of Health. By Matthew Trueman, M.D., &c. London, 1842. 12mo. Pp. 240.

Quacks and Quackery unmasked, or Strictures on the Manual Art as now practised by Physicians, Surgeons, and Apothecaries ; with some Regulations for its complete Reform ; and Hints in connection with the Cold Water Cure. By J. E. Feldmann, M. D., &c. London, 1842. 8vo. Pp. 112.

The Anatomy of Sleep ; or the Art of procuring sound and refreshing Slumber at will. By Edward Binns, M. D. Lond. 1842. 12mo. Pp. 324.

A Treatise on the Principles and Practice of Homoeopathy. By Francis Black, M. D. London, Edinburgh, and Dublin, 1842. Large 8vo. Pp. 239.

Lectures on Animal Physiology, or the Physical Condition of Man, &c. By B. T. Lowne, of St Bartholomew's Medical School, London. London, 1842. 12mo. Pp. 101.

On Injuries of the Head, Affections of the Brain. By G. J. Guthrie, F. R. S., Surgeon to the Westminster Hospital, &c. London, 1842. 4to. Pp. 155.

On the History, Diagnosis, and Treatment of Typhoid and of Typhus Fever ; with an Essay on the Diagnosis of Bilious Remittent, and of Yellow Fever. By Elisha Bartlett, M. D. &c. Philadelphia, 1842. 8vo. Pp. 393.

Report to her Majesty's Principal Secretary of State for the Home Department from the Poor Law Commissioners, on an Inquiry into the Sani-

tary Condition of the Labouring Population of Great Britain; with Appendices. Presented to both Houses of Parliament by Command of Her Majesty, July 1842. London, 1842. 8vo. Pp. 457.

A Treatise on the Enlarged Tonsil and Elongated Uvula, in connection with Defects of Voice, Speech, and Hearing, &c. By James Yearsley, M.R.C.S., &c. London, 1842. 8vo. Pp. 83.

An Account of Askern and its Mineral Springs, &c. By Edwin Lankester, M.D., &c. London, 1842. 12mo. Pp. 151.

Clinical Midwifery; with the histories of 400 cases of difficult labour. By Robert Lee, M.D., F.R.S. London, 1842. 12mo. Pp. 224.

Commentaries on some Doctrines of a Dangerous Tendency in Medicine, and on the General Principles of safe Practice. By Sir Alexander Crichton, M.D., F.R.S. London, 1842. 8vo. Pp. 283.

The Simple Treatment of Disease deduced from the Methods of Expectancy and Revulsion. By James M. Gully, M.D., &c. London, 1842. 12mo. Pp. 198.

Deformities of the Spine and Chest, successfully treated by exercise alone; &c. By Charles H. Rogers Harrison, M. R. C. S. Illustrated by Drawings. London, 1842. 8vo. Pp. 164.

A System of Practical Surgery. By William Fergusson, F.R.S.E., Professor of Surgery in King's College, London. London, 1842. 8vo. Pp. 596.

Chemical Manipulation, being Instructions to Students in Chemistry, on the Methods of performing Experiments of Demonstration, or Research with accuracy and success. By Michael Faraday. D. C. L. F. R. S., &c. Third Edition, revised. London, 1842. 8vo. Pp. 664.

On Gravel, Calculus, and Gout: chiefly an Application of Professor Liebig's Physiology to the Prevention and Cure of these Diseases. By H. Bence Jones, M.D., Cantab. &c. London, 1842. 8vo. Pp. 142.

The Practical Diagnosis of Diseases of the Lungs. By Walter Hayle Walshe, M.D., &c. London, 1843. 12mo.

Elements of Chemistry, including the Discoveries and Doctrines of the Science. By the late Edward Turner, M.D., &c. Sixth Edition, enlarged and revised by Justus Liebig, M.D., &c., William G. Turner, Ph. D. and William Gregory, M.D. Part III. No. 4. The completion of the Organic Chemistry, with titles, index, and contents. London, 1842. 8vo. Pp. 1157—1322.

The Annals of Chymistry, Vol. i. No. 12. London, 8vo.

The Cyclopædia of Anatomy and Physiology. Edited by Robert B. Todd, M.D., F.R.S. Part XXIII. Menstruation—Nerve. April 1842.

London Medical Gazette for Session 1842—1843. No. 53.

Gazette Medicale de Paris, No. 39, 24th Sept. No. 51, 10th Dec. 1842.

American Journal of Medical Sciences. No. 5 and 7.

British and Foreign Quarterly Review. No. 28.

Weekly Tables of Mortality for the Metropolis. No. 17, 17th September 1842. No. 30, 17th December 1842.

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EDINBURGH
MEDICAL AND SURGICAL JOURNAL.

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Communications have been received from Mr ROBERTSON, Dr C. HOLLAND, and Dr STEVENSON.

The following publications have been received :—

On the Ganglia and the other Nervous Structures of the Uterus. By Robert Lee, M. D., F. R. S., &c. London, 1842. 4to. Pp. 11. Two plates. An Appendix to the foregoing. 4to. Pp. 6. One plate.

Cases of Peritoneal Section for the Extirpation of Diseased Ovaria, &c. By Charles Clay, M. R. C. Phys. London, 1842. 4to. Pp. 18.

The Causes, Nature, Diagnosis, and Treatment of Acute Hydrocephalus; or Water in the Head. A Prize-Essay to which the Medical Society of London awarded the Fothergillian Gold Medal for 1842. By James Risdon Bennett, M. D. Edin., &c. London, 1843. 8vo. Pp. 248.

Essays on Surgical Pathology and Practice. By Alexander Watson, M.D. &c. Part I. On Abdominal Herniæ. Edin. Lond. 1843. 4to. Eight Lithographed Plates.

Interment and Disinterment; or a Further Exposition of the Practices pursued in the Metropolitan places of Sepulture, and the results as affecting the health of the Living: in a series of Letters to the Editor of the Morning Herald. By G. A. Walker, Surgeon, &c. London, 1843. 8vo. Pp. 28.

The Physical Diagnosis of Diseases of the Lungs. By Walter Hayle Walshe, M. D., Professor of Pathological Anatomy in University College, London, &c. London, 1843. 12mo. Pp. 307.

Two Lectures on the Defective Arrangements in Large Towns to secure the Health and Comfort of their Inhabitants. Read before the Hull Literary and Philosophical Society, 27th Dec. 1842 and January 10, 1843. By Humphrey Sandwith, M. D. &c. London, 1843. 8vo. Pp. 55.

Companion to the Pharmacopœia. By Samuel Thomson, M. D. Edin. and London, 1842. Book First. 12mo. Pp. 148.

Observations on the Principal Medical Institutions and Practice of France, Italy, and Germany; with notices of the Universities and Climates; and Illustrative Cases. By Edwin Lee, M. R. C. L. &c. 2d edition, re-written and considerably enlarged, with a parallel view of English and Foreign Medicine and Surgery. London, 1842. 12mo. Pp. 269.

Animal Magnetism. Being the First Part of Animal Magnetism and Homœopathy, with Notes illustrative of the Influence of the Mind on the Body. By Edwin Lee, Esq. 3d edition, with considerable alterations and additions. London, 1843. 12mo. Pp. 86.

Practical Observations on Midwifery, with Cases in Illustration. By John Ramsbotham, M. D., late Lecturer on Midwifery at the London Hospital, &c. 2d edition, revised, in one volume. London, 1842. 8vo. Pp. 501.

The Climate of South Devon, and its Influence upon Health, &c. By Thomas Shapter, M. D., &c. London, 1842. 12mo. Pp. 258.

A System of Clinical Medicine. By Robert James Graves, M. D., M. R. I. A., one of the Physicians of the Meath Hospital, &c. &c. Dublin, 1843. 8vo. Pp. 437.

Pharmacologia, being an Extended Inquiry into the Operations of Medicinal Bodies, upon which are founded the Art and Theory of Prescribing. By John A. Paris, M. D., Cantab., F. R. S., &c. Edition the 9th. London, 1843. 8vo. Pp. 622.

Outlines of Pathology and Practice of Medicine. By William Pulteney Alison, M. D., F. R. S. E. Part I. Preliminary Observations. Part II. Inflammatory and Febrile Diseases. Edinburgh and London, 1843. 8vo. Pp. 499.

Pulmonary Consumption, its Prevention and Cure established on New Views on the Pathology of the Disease. By Henry Gilbert, M. R. C. Surgeons. London, 1842. 8vo. Pp. 296.

A Description of the Mineral Springs of Aix-la-Chapelle and Borette ; with some account of the curiosities of both places and the Environs. By L. Wetzlar, M. D., Physician at Aix-la-Chapelle. London, 1842. 12mo. Pp. 88.

Chemical Manipulation ; with Instructions to Students in Chemistry on the methods of performing Experiments of Demonstration or Research with accuracy and success. By Michael Faraday, D.C.L., &c. Third Edition. Revised London, 1842. 8vo. Pp. 664.

The Principles of Human Physiology ; with their chief application to Pathology, Hygiene, and Forensic Medicine. By William B. Carpenter, M.D., &c. London, 1842. 8vo. Pp. 680.

Remarks on Medical Reform, in a second Letter addressed to Sir James Graham, Bart., &c. By Sir James Clark, Bart., M.D., &c. London, 1843. 8vo. Pp. 40.

Description of the Genus Cuma, &c. By Henry D. S. Goodsir, Esq. 8vo. Pp. 11. (Edin. New Phil. Journ. Jan. 1843.)

Norske Magazin vor Lægeviderskaben Udgivet af Lægeforeningen i Christiania Redigeret af Ch. Boeck, A. Conradi, Chr. Helberg, J. Hjort, F. Holst. 1841, 1842. Christiania. This is a new Swedish Medical Journal.

The London Medical Gazette for the Session 1842-1843. No. 1, Sept. 30, 1840—No. 24, March 18th 1843.

The Medico-Chirurgical Review or Quarterly Journal of Medicine, No. 75. Edited by James Johnson, M. D., &c.

The British and Foreign Medical Review of Practical Medicine and Surgery. Edited by John Forbes, M. D., F. R. S., &c. No. xxix. January 1843.

Transactions of the Medical and Physical Society of Bombay. No. iv. For the year 1841. Bombay, 1841, 8vo.

Annals of Chymistry and Practical Pharmacy. No. 13, 14, 15, 16, 17, 18. Friday, January 27th 1843.

Weekly Tables of the Mortality of the Metropolis. No. 1, Saturday, 7th January 1843. No. 10, Saturday, 11th March 1843.

Summary of the Weekly Tables of Mortality for 1842.

A Quarterly Table of Mortality in 114 Districts of England and Wales.

L'Examineur Medical. Redacteurs en chef MM. Ann. Dechambre et Aug. Mercier. No. 14, 15 Janvier. No. 15, No. 16, 17, 18, 15 Mars 1843.

L'Experience Journal de Medecine et de Chirurgie publi . Par M. Le Docteur J. A. Henroz. No. 289, No. 291, 26 Janvier. No. 292, 293, 294, 295, 296, 297, 298. 16 Mars 1843.

THE
EDINBURGH
MEDICAL AND SURGICAL JOURNAL.

1. JANUARY 1843.

PART I.

ORIGINAL COMMUNICATIONS.

ART. I.—*A Report of the Cases of Fractures of the larger Bones of the extremities, and those immediately connected with them, which were admitted into the Liverpool Northern Hospital from March 1834 to December 1841.* By JOHN M. BANNER, Senior Surgeon.

THERE have been 819 cases of fracture of the larger bones of the extremities admitted into the hospital from March 1834 to December 1841, exclusive of the fractures of the metatarsal and metacarpal bones, as well as of the phalanges of the fingers and toes.

Of the 819 cases, 279 were of the superior extremities; 479 were of the inferior extremities, and 61 were either of the superior or inferior extremity, but complicated.

Superior Extremity.			
Fractures of the clavicle,	.	.	46
scapula,	.	.	10
humerus,	.	.	64
radius alone,	.	.	48
ulna alone,	.	.	21
radius and ulna,	.	.	90

279

The fractures of the clavicle were simple, with the exception of one case of compound fracture.

Of the fractures of the humerus, fifty-two were simple, or comminuted, and twelve were compound.

Of the fractures of the scapula, four were of the neck, four of the acromion process, one of the coronoid process, and one of the body.

Of the fractures of the radius alone, forty-eight were simple, as of those of the ulna alone twenty-one were simple.

Of the fractures of the radius and ulna, seventy-six were simple or comminuted ; fourteen were compound.

Inferior Extremity.	
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tibia alone,	29
fibula alone,	45
tibia and fibula,	223
patella,	13
tarsus,	8
	<hr/>
	479

Of the fractures of the pelvis, eleven were simple and one compound.

Of the fractures of the femur, 132 were simple or comminuted, and 17 were compound.

Of the fractures of the tibia alone, 29 were simple or comminuted.

Of the fractures of the fibula alone, 45 were simple.

Of the fractures of the tibia and fibula, 135 were simple or comminuted, and 88 were compound.

Of the fractures of the bones of the tarsus, two were of the cuboid, three of the calcis, and three of the astragalus.

Complicated fractures were as follows :

A case of compound fracture of the tarsal and metatarsal bones, with extensive laceration of the sole of the foot. Amputated.

A case of dislocation of the ankle-joint, and fracture of the tibia and fibula. Cured.

A case of compound comminuted fracture of the humerus, with extensive contusion and laceration of the muscles and integuments. Cured.

A case of dislocation of the elbow and fracture of the inner condyle of the humerus, aged 41. Cured.

A case of dislocation of the ankle-joint, with fracture of the tibia and fibula, aged 32. Cured.

A case of fracture of the clavicle, neck of the scapula, and of the third and fourth ribs, accompanied with extensive emphysema, aged 41. Cured.

A case of compound fracture of the ilium, and fracture of both femurs, extreme state of collapse, aged 38. Died.

A case of comminuted fracture of the radius, and dislocation of the wrist-joint, aged 27. Cured.

A case of simple fracture of the radius, and dislocation of the wrist-joint, aged 32. Cured.

A case of compound dislocation of the ankle-joint, with fracture of the tibia, aged 62. This accident occurred two days before admission into the hospital. It became necessary to wait twenty days before amputation could be performed. The case terminated fatally.

A case of compound fracture of the tibia and fibula, with fracture of the ribs and extensive emphysema, aged 49. Died.

A case of fracture of the pelvis, with extensive laceration of the perineum, aged 19. Cured.

A case of compound fracture of the right femur; simple fracture of the left; compound fracture of the humerus, and simple fracture of the fore-arm, aged 18. Died.

A case of dislocation of the elbow, (radius and ulna backwards,) with fracture of the inner condyle of the humerus, aged 38. Cured.

A case of compound fracture of both thighs, and fracture of the right tibia and fibula; admitted on the 2d of January, aged 24; attacked with erysipelas on the 26th February; died on the 3d of March.

A case of dislocation of the ankle-joint, with fracture of the tibia and fibula, aged 45. Cured.

A case of dislocation of the ankle-joint, and fracture of the tibia and fibula, aged 34. Cured.

A case of fracture of the tibia and fibula, with laceration of the anterior tibial artery; amputation. Died.

A case of fracture of the tibia and fibula, and extensive laceration, followed by sloughing. Cured.

A case of fracture of the tibia into the ankle-joint, and fracture of the fibula, high up; extensive effusion into the joint; traumatic delirium; amputation. Died.

A case of fracture of the tibia and fibula; dislocation of the wrist, and concussion of the brain, aged 59. Died.

A case of fracture of the femur; compound fracture of the radius, and compound dislocation of the elbow; amputation. Recovered.

A case of compound fracture of the femur; extensive contusion of the soft parts, caused by machinery, aged 45. Died.

A case of compound fracture of the femur; laceration of the femoral artery; extreme collapse. Died, aged 33.

A case of fracture of the pelvis and rupture of the urethra; ad-

mitted on the 8th of November; died on the 28th of November, aged 24. On examination after death, a portion of the descending ramus of the pubis was found perforating the bladder.

A case of fracture of the femur, with contusion of the abdomen, followed by peritonitis. Died.

Four cases of dislocation of the ankle, and fracture of the tibia and fibula. All cured.

A case of oblique fracture of the tibia into the knee-joint, with fracture of the fibula low down. Cured.

A case of dislocation of the elbow-joint (radius and ulna backwards) with fracture of the inner condyle. Cured.

A case of compound fracture of the right tibia and fibula, and simple fracture of the left tibia and fibula; dislocation of the ankles; also fracture of the astragalus, and laceration of the foot; extreme collapse. Died.

A case of compound fracture of the femur, with fracture of the skull and compression of the brain. Died.

A case of compound comminuted fracture of both *os humeri* (from the bursting of a cannon,) aged 50. Cured.

A case of fracture of the humerus, and fracture of the ribs, with extensive emphysema. Died.

A case of fracture of the tibia and fibula, with internal hemorrhage. Amputation. Recovered.

A case of compound dislocation of the ankle-joint, with fracture of the fibula, high up; traumatic delirium, amputation. Death.

A case of compound fracture of the cuboid bone, with wound of the foot; amputation. Recovery.

A case of compound fracture of the radius and ulna, with severe contusion and laceration of the muscles; amputation. Recovery.

A case of compound dislocation of both ankles, fracture of the fibula, severe laceration of the soft parts; amputation. Death.

A case of compound dislocation of the ankle-joint, and fracture of the inner malleolus. Died.

A case of compound comminuted fracture of the humerus, wound of the brachial artery; amputation. Recovery.

A case of compound fracture of the tibia and fibula into the ankle-joint, with rupture of the anterior tibial artery; amputation. Recovery.

A case of compound fracture of the radius and ulna, with extensive laceration of the muscles. Cured.

A case of fracture of the tibia and fibula, with internal hemorrhage; amputation. Death.

A case of fracture of the tibia into the knee-joint, with rupture of the popliteal artery; amputation. Death.

A case of compound dislocation of the ankle-joint, with compound comminuted fracture of the tibia and fibula ; amputation. Death.

A case of compound fracture of the tibia and fibula, with severe laceration of the muscles. Cured.

A case of fracture of the tibia into the knee-joint, with laceration of the artery ; amputation. Recovery.

A case of compound fracture of the femur, dislocation of the knee-joint, and rupture of the femoral artery ; amputation. Recovery.

A case of compound comminuted fracture of the radius and ulna of both arms, with considerable laceration of the soft parts, collapse. Death.

A case of compound fracture of the bones of the wrist, and extensive laceration of the tendons ; amputation. Recovery.

A case of compound dislocation of the ankle-joint, and fracture of the tibia. Cured.

A case of compound fracture of the femur, with considerable laceration of the muscles. Cured.

A case of compound fracture of the radius and ulna, and extensive laceration of the muscles ; amputation. Recovery.

A case of compound comminuted fracture of the tibia and fibula, with great hemorrhage ; amputation. Recovery.

A case of compound dislocation of the ankle-joint, and fracture of the tibia and fibula. Cured.

A case of fracture of the radius and ulna, with laceration of the wrist-joint. Cured.

A case of compound fracture of the femur, tibia, and fibula. Cured.

A case of compound fracture of the radius and ulna, and compound fracture of the tibia and fibula, with laceration and contusion of the muscles ; collapse. Death.

GENERAL RESULTS OF THE FRACTURES.

The fractures of the clavicle were cured.

The fractures of the scapula were cured, with the exception of that of the coronoid process, with part of the glenoid cavity. The fractured portion was drawn down into the axilla, and could not be returned. The patient, after a considerable lapse of time, was enabled to use the arm with tolerable freedom.

The cases of fractures of the humerus were cured.

The cases of fractures of the radius alone were cured.

The cases of fractures of the ulna alone were cured.

The cases of fractures of the radius and ulna were cured.

Of the cases of fracture of the pelvis, seven were cured and five died.

Of the 149 cases of fracture of the femur, 148 were cured ; one died ; fifteen were of the neck of the bone, which united with the exception of three.

The cases of fracture of the tibia alone were cured.

The cases of fracture of the fibula were cured.

Of the 223 cases of fracture of the tibia and fibula, 219 were cured, and four died.

The cases of fracture of the patella were cured.

Of seven cases of fracture of the tarsus, six were cured and one died.

Of the complicated fractures, forty-one were cured, and twenty died. *

Total number of cures,	.	.	791
Total number of deaths,	.	.	28
			<hr/> 819

AMPUTATIONS.

There have been forty-seven amputations resulting from severe injuries ; of these thirty-four recovered, thirteen died.

11 were of the superior extremity.

32 were of the inferior extremity.

3 were cases of double amputation, or cases where two limbs were removed from one person.

1 was a partial amputation.

The Superior Extremity.

4 were above the elbow, viz. 2 cured, 2 died.

7 were below the elbow ; 6 cured, 1 died.

The Inferior Extremity.

9 were above the knee, viz. 6 cured, 2 died.

23 were below the knee, viz. 19 cured, 4 died.

The case where an arm and leg were amputated, died.

The case where two legs were amputated, died.

The case where two arms were amputated, died.

The case of partial amputation of the foot, recovered.

Of the above cases,

36 were primary ; 28 cured ; 8 died.

11 were secondary ; 6 cured ; 5 died.

Of the primary amputations,

2 were above the elbow ; 1 cured ; 1 died.

7 were below the elbow ; 6 cured ; 1 died.

7 were above the knee ; 6 cured ; 1 died.

16 were below the knee ; 14 cured ; 2 died.

* Three of the cases of fracture of the pelvis, and one of the cuboid bone, reported as terminating fatally, were complicated with other injuries, and are enumerated in the twenty fatal cases of complicated fracture.

1 of an arm and leg,	died.
1 of two legs,	died.
1 of two arms,	died.
1 partial of the foot,	cured.

28 cures. 8 deaths.

Of the secondary amputations.

2 were above the elbow ; 1 cured ; 1 died.

2 were above the knee ; 2 died.

7 were below the knee ; 5 cured ; 2 died.

6 cured. 5 died.

Ages of the persons on whom amputation was performed.—Eighteen amputations were on persons between the ages of 10 and 30 ; of these seventeen recovered, one died.—Fifteen were on persons between the ages of 30 and 45 ; of these nine recovered, six died.—Five were on persons between the ages of 45 and 55 ; of these four recovered, one died.—Eight were on persons between the ages of 55 and 70 ; of these five recovered, three died.—Of the cases, 45 were males ; 2 were females.

NATURE OF THE CASES REQUIRING AMPUTATION, AND THE RESULTS.

James Tattersall, aged 56. Compound fracture of the tibia and fibula, and laceration of the anterior tibial artery. An old soldier of dissipated habits. The leg was amputated two days after the accident. He died four months afterwards from repeated collections of matter in various parts of the body.

Foulk Gunnerson, aged 61. Compound fracture of the tibia and dislocation of the ankle-joint. This man was not brought into the hospital until two days after the injury ; the inflammatory symptoms were so severe that amputation could not be performed until after the expiration of twenty days. He died.

James Moore, aged 32. Compound fracture of the tibia and fibula, with laceration of the muscles, and wound of the tibial artery. Slight collapse,—amputated immediately. Recovered.

Oliver Townley, aged 57. Simple fracture of the tibia with symptoms of internal hemorrhage coming on six hours after admission ; amputated the same evening above the knee. Recovered.

Cornelius M'Guire, aged 24. Compound fracture of the carpal and metacarpal bones ; severe laceration of the muscles and tendons of the hand ; amputated the same day. Recovered.

John Davies, aged 32, an African. Compound fracture of the tibia and fibula, with extensive laceration and contusion of the soft parts ; amputated as soon as the symptoms of collapse were

somewhat relieved. The stump healed well ; abscesses afterwards formed in various parts of the body. The cause of death was an abscess in the brain. This patient had symptoms of phlebitis after the operation, but lived three months.

Charles Muscar, aged 44. Fracture of the tibia and fibula and dislocation of the ankle. Traumatic delirium presented itself on the fourth day, when amputation was performed ; he died, never having recovered from the delirium. He had led a very irregular life, and had drank hard. On examining the leg, the fibula was found broken in two places at its lower third, and near its head. At this part the bone was so broken as to form long projecting points, of one and two inches length, which had penetrated deeply into the muscles, and had kept up great and constant irritation.

John Pepper, aged 22, a pilot, in excellent health, and of a good constitution. Compound fracture of the tibia and fibula, with extensive contusion and laceration, caused by the breaking of a rope which coiled round the leg ; amputated immediately. Recovered.

David Griffith, aged 54. Compound fracture of the humerus, with laceration of the brachial artery high up ; amputated four hours afterwards, when slight reaction took place after great collapse. Recovery.

James Smylie, aged 31. Compound fracture of the tibia and fibula into the ankle-joint, with extensive hemorrhage caused by the falling of a large stone ; amputated immediately. During the collapse state, the symptoms of collapse were urgent. Recovery.

John Joseph, aged 63, a rigger. Compound fracture of the cuboid bone, and wound of the foot, followed by traumatic gangrene ; admitted into the hospital on the 10th June ; amputated 29th August. Recovery.

John Fitzgerald, aged 27. Compound comminuted fracture of the tibia and fibula, with extensive laceration ; amputated as soon as he rallied somewhat from the collapse occasioned by the shock. Recovered.

John Drew, aged 14. Compound comminuted fracture of the radius and ulna, with extensive contusion and laceration of the muscles ; amputated immediately. Recovery.

John Fleming, aged 30. Fracture of the tibia into the knee-joint, with rupture of popliteal artery ; amputated above the knee eight hours after the accident. Recovery.

John Thomas, aged 41. Compound dislocation of both ankle-joints, with extensive laceration and hemorrhage ; collapse very extreme ; after waiting six hours the right leg was amputated, when a greater depression of the system took place. The left leg was amputated after the expiration of fourteen hours. He died the day following. This patient had fallen into a deep dry well. On

examining the limbs after amputation, each *os calcis* was found much fractured. The autopsy showed considerable internal injury. The spleen was ruptured, and there was a large quantity of bloody serum found in the cavity of the thorax.

John Waterson, aged 29. Compound fracture of the tibia and fibula, with extensive laceration of the muscles and tendons of the foot; amputated the same day. Recovery.

Roger Omes, aged 60. Fracture of the tibia and fibula, and wound of the anterior tibial artery; amputated on the third day after the accident. Died.

John Williams, aged 28. Compound fracture of the tibia and fibula, and severe contusion and laceration of the soft parts; amputated the same day. Recovery.

Peter Webb, aged 30. Compound fracture of the bones of the foot; partial amputation. Recovery.

James M'Donald, aged 38. Fracture of the tibia into the knee-joint, laceration of the popliteal artery, collapse; amputated the same day. Died.

Richard Littlewood, aged 32. Fracture of the tibia and fibula into the ankle-joint; extensive suppuration; amputated the second week. Recovery.

David Jones, aged 24. Compound dislocation of the ankle-joint, and fracture of the tibia and fibula; amputated the same day; died two months after the operation, from extensive suppuration.

Thomas Lea, aged 13. Compound fracture of the tibia into the ankle-joint, and laceration of the anterior tibial artery; immediate amputation. Recovery.

Richard Sherratt, aged 15. Compound fracture of the femur, dislocation of the knee, and rupture of the popliteal artery; amputated the same day. Recovery.

Thomas Webster, aged 55. Compound comminuted fracture of the radius and ulna of both arms, with extensive laceration of the muscles, nerves, &c.; considerable contusion and laceration of the right thigh; labouring under severe symptoms of collapse, which had somewhat abated when both arms were amputated. Died on the second day, never having recovered properly from the collapse.

William Williams, aged 58. Compound fracture of the bones of the wrist, and extensive laceration of the muscles and tendons; amputated the same day. Recovered.

Ann M'Conkie, aged 50. Compound dislocation of the ankle-joint, with fracture of the tibia; amputated the same day. Recovered.

Richard Murray, aged 52. Compound fracture of the tibia and fibula; admitted 17th September; amputated the 12th of October. Recovered.

Barney Cross, aged 15. Compound fracture of the femur, with extensive contusion and laceration of the muscles; amputated the same day. Recovered.

Edward Wilkinson, aged 32. Compound dislocation of the elbow; admitted the 20th; traumatic gangrene came on the 25th, on which day the arm was amputated; the brachial artery was found torn across. Recovered.

Philip Fee, aged 12. Compound fracture of the arm, the hand nearly torn off; amputated the same day. Recovered.

Josè Candy, aged 37. Fracture of the tibia and fibula, and contusion; admitted on the 8th of February; amputated the 18th of the same month, in consequence of traumatic gangrene. Recovered.

Hugh Barr, aged 24. The foot torn off by machinery; amputated the same day. Recovered.

Stephen Bury, aged 29. Compound fracture of the tibia and fibula, accompanied by severe laceration of the muscles; amputated the same day. Recovered.

Roger Brown, aged 64. Compound dislocation of the astragalus, with fracture of the fibula; amputation the same day. Recovered. The subject of this was of bad constitution, and had been a hard drinker.

Sarah Baxter, aged 38. Compound fracture of the tibia and fibula, and extensive laceration of the muscles from machinery; amputated the same day. Recovered.

James M'Garrow, aged 26. Compound dislocation of the ankle-joint, with fracture of the tibia and fibula; hemorrhage; amputated the same day. Recovered.

James Ainsworth, aged 27. The hand torn off, with fracture of the radius and ulna; amputated the same day. Recovered.

William Wallace, aged 45. Compound fracture of the femur, and compound fracture of the tibia and fibula, with severe contusion of the soft parts; amputated the same day. Recovered.

Andrew Garson, aged 42. Compound fracture of the tibia and fibula, and laceration of the artery and muscles; amputated the same day. Recovered.

Henry Marstall, aged 57. Compound dislocation of the wrist, with severe laceration of the flexor tendons; amputated the same day. Recovered.

John Ganeh, aged 19. Compound fracture of the bones of the carpus, and extensive laceration of the hand; amputated on the same day. Recovered.

Charles Faulkes, aged 29. Compound fracture of the femur into the knee-joint; amputated the same day. Recovered.

Andrew Ford, aged 43. Dislocation of the femur into the dorsum of the ilium; fracture of the fibula; compound disloca-

tion of the wrist, comminuted fracture of the radius and ulna of the same arm, with laceration of the soft parts; the arm was amputated the same day. Died. This man never rallied from the collapse consequent on the injuries.

Thomas Arkwright, aged 43. Compound fracture of the radius, and severe injury to the soft parts of the arm; hemorrhage; also compound fracture of the tibia and fibula, with severe injury of the soft parts; both extremities were amputated on the same day. He never rallied from the effects of the shock.

David Wright. Compound dislocation of the elbow-joint; gangrene affected the limb on the third day. When it was amputated, the artery was found torn across. Recovered.

There were five cases of old ununited fracture admitted; three recovered by rest and well-directed pressure; two were operated on, by removing the ends of the fractured portions of bone. The first case occurred in a man, aged 27, who had ununited fracture of the femur of eighteen months standing. After trying various methods of treatment, which occupied a period of five months, the ends of the bone were sawn off; union took place; the patient recovering with a strong and useful leg.

The second case occurred in a woman, aged 32, who had an ununited fracture of the lower third of the tibia of many months standing. The ends of the bone were sawn off; an inch and a-half of the fibula had to be cut out before the cut ends of the tibia could be brought in contact, as that bone had never been fractured. This appeared to have been the cause of non-union. The case was one of compound comminuted fracture; several large pieces of the tibia had been removed, causing a considerable vacuum between the ends of the bone. This patient recovered with a useful leg; the limb was between two and three inches shorter than its fellow. The woman is obliged to use a stick to aid her in walking.

Remarks.—The treatment of fractures of the long cylindrical bones is so well understood at the present day, that it is unnecessary to dwell on the mode which has been adopted in the cases under notice. There are, however, certain observations, resulting from the treatment of the more severe injuries which appear of importance, emanating, as they do, from a practice of no mean extent. The first great question which naturally presents itself in the treatment of severe fractures is, whether the injury is of such a character as to justify the surgeon in attempting to save the limb. Much rests on this important point. The life of the patient may be lost in attempting to save the limb, or the limb may be unjustifiably amputated. The first examination in such cases is all important. It should be made with great care and patience, and the surgeon should, if possible, fully satisfy himself of its ex

act nature, so that any future examination may be rendered unnecessary. Difficult as the question is, there are certain circumstances which, when taken into account, naturally lessen embarrassment. Thus, there are injuries characterized by peculiarities, which, from their known fatal results, point out the unreasonableness of attempting to save the limb, and render amputation, as it were, imperative. Again, there are injuries of a very severe character, wherein the surgeon is justified in attempting to save the limb. In the first class of cases here alluded to, are comprehended severe lacerations of the muscles and tendons, with simple or compound fracture, such as result from machinery, or anything causing much friction; for instance, the coiling of an over-stretched rope round the limb, or severe contusion accompanying the fracture; compound fracture extending into the knee-joint; fracture with laceration of the femoral artery; fracture with severe injury of the large nerves; comminuted compound fracture of the tarsal bones, particularly of the *os calcis* or astragalus. This may be said also, with regard to the carpal bones when accompanied with laceration of the muscles and tendons; longitudinal fractures of the long cylindrical bones entering a joint; compound fracture of the tibia into the ankle-joint, with laceration of the tibial artery; fracture with internal hemorrhage.

The second class comprehends cases of severe compound, or compound comminuted fractures; compound fracture extending into the ankle-joint; compound fracture, with considerable laceration of the soft parts; fracture, with considerable contusion. It is impossible to enumerate the several cases in which it will be proper to attempt to save the limb, as many circumstances will have to be taken into account.

Those cases which have been mentioned, are such as have presented themselves at the Liverpool Northern Hospital. The recorded experience of a long period clearly proves that the injury of bone, abstractedly considered, is not dangerous; and, whatever bad consequences follow, will principally depend either upon the degree of mischief done to the soft parts, or upon the inflammation of such parts, excited by the same violence that broke the bone, or upon the irritation of them by the spiculæ and sharp projections of the fracture. In short, the danger appears to be in the ratio of the injury done to the soft parts, and this is produced by the manner in which they are affected by the fracture, or the power which has effected the injury.

In determining the momentous question, whether the attempt to save the limb be made or not, several points will have to be taken into consideration, independent of the allusions already made. The age of the individual forms a feature in the case. It has been found that patients whose ages did not exceed thirty have had constitutions capable of bearing the severe shocks arising from

these injuries, much better than those more advanced in life. Two remarkable instances occurred in boys of 10 and 15 years of age. In one, where there was compound fracture of the tibia and fibula, with extensive laceration into the ankle joint; the internal and external malleolus came away; the patient recovered with a good leg and foot. The other case was one of compound fracture of the tibia and fibula, with severe laceration and contusion of the muscles and integuments, the foot being literally held by the torn muscles; the integuments having been lacerated over the whole circumference of the leg. This accident was occasioned by a heavy canal boat pressing the leg against the stones forming the side of the canal, while the boat was drawn along by horses, the leg being rolled in its passage. This boy recovered without a single bad symptom. On the other hand, apparently slight injuries occurring in persons of a more advanced age, often terminated badly. As an illustration may be mentioned, the case of John Joseph, aged 63, who cut his foot with an axe. The cuboid bone was fractured. Traumatic gangrene was the result of the inflammation which followed the accident, and so destructive was its character that amputation was had recourse to, to save life. It is unnecessary to instance many cases in exemplification of the fact, that persons above the age of 30 will not bear the same degree of injury as well as those below it, and the higher they advance in years, the less power has the constitution to bear the shock occasioned by severe injuries.

The previous habits must exclusively guide the surgeon in his determination. Too much attention cannot be paid to this inquiry. The man who has led a dissipated life can ill support a moderate shock to the constitution; and where it can be ascertained that the previous habits have been bad, the surgeon will not do well to trust too much to nature's reparative powers.

The state of the constitution at the time of the accident should be also ascertained, as this may likewise, very materially, influence the surgeon in his determination.

Whether the superior or the inferior extremity be injured, will make considerable difference; as it is well proved, that very severe injuries of the upper extremities will do well, when it would be unsafe to attempt to save an inferior extremity, where the same amount of injury had been inflicted.

It seldom happens, where the accident is of so severe a nature as to demand amputation, that the patient is in a state to bear the immediate performance of it; the depressed state of the vital powers is such as frequently to endanger life. In some instances the patient never rallies, and here a very important question raises itself, namely, as to the most fitting time for the operation. This difficulty continually presents itself in severe injuries to the extremities requiring amputation: whether it be well to operate during the collapse of the patient, or to wait for

increased power given to the constitution by reaction, is a point for consideration. In several very urgent cases where there have been but slight indications of reaction or an increase of vital power, amputation has been successful. In these instances, although the operation appeared to give an additional shock to the system, yet reaction almost invariably returned in a short time. In three cases amputation was performed during extreme collapse,—cases in which a fatal hemorrhage was existing, and where the patients, instead of showing any signs of rallying, were gradually becoming more depressed. Two died, one recovered; and one of the patients who died required amputation of both legs. Other cases died from the effects of the shock on the system, where it was considered unjustifiable to amputate.

Many hold the opinion that the knife is a good stimulus in these cases, and that the operation is rather beneficial than otherwise. So far is this from being the case in the instances which have occurred here, that the conclusion arrived at is,—that in cases of extreme collapse, amputation should not be performed, unless there be hemorrhage, which, if not arrested, would of itself destroy the patient. Where the sufferer complains of great pain, the chances are more favourable than where there appears an absence of sensibility. There is, perhaps, no worse symptom than a great want of feeling evinced in cases of collapse; it indicates extreme depression of the vital powers, from which the patient rarely recovers.

In severe injuries of the extremities, accompanied by hemorrhage, and where collapse exists, it were better to amputate immediately than to allow the patient to sink from the loss of blood. There will be a possibility of reaction taking place, and by the operation is given the only remaining chance. In such an instance the operation will be proper. In severe cases, however, where the immediate danger arises from the depression of the vital powers, and where the operation can be delayed, although at considerable risk, amputation ought not to be performed: good cannot result from it. By having recourse to it, the only chance left may be destroyed, as undoubtedly such a step would only increase the depression of the vital powers. It will be more prudent even to risk inflammation and its consequences, than to attempt to amputate where the symptoms of collapse are urgent, unless alarming hemorrhage is present, and then it may be justifiable, as the only chance left for the patient. It may be contended that hemorrhage can be restrained; let it be recollected, however, that the symptoms of collapse may, and do frequently exist many hours. Compression sufficiently decided cannot be kept up for the time required without great additional danger.

Another important point for consideration is the time at which secondary amputation should be performed. The surgeon not un-

frequently experiences the mortification of seeing his best endeavours fail, and the limb, which at the time of accident presented no other than symptoms most favourable to its preservation, rapidly assuming an unfavourable aspect ; or the limb, which in consequence of the urgent symptoms of collapse, could not be amputated in the first instance, speedily inflaming, and if the patient lives long enough, running on to suppuration or traumatic gangrene. The experience derived from the foregoing cases leads to the conclusion, that where the inflammation runs on to suppuration, amputation can be safely performed. The incisions may be made even through the abscess ; yet where this can be avoided, it is highly proper to do so.

When inflammation terminates in traumatic gangrene, amputation may be performed with safety. Cases have occurred where the operation was successfully performed, though the gangrene was extending rapidly, and the patient reduced to the last extremity. So extraordinary have been the recoveries under such circumstances, that the surgeon should never look at the case as hopeless, or neglect to give the patient this chance of life. The same may be said of cases which run on to suppuration, accompanied by urgent symptoms of hectic. Though reduced to the extremest possible danger, yet, on the timely removal of the source of the evil, the patient lives.

It not unfrequently happens, where the patient lives beyond the first stages and dangers of inflammation, that we have to encounter a series of profuse abscesses, of great extent, with hectic disturbance of the most alarming kind, and which can only be arrested by removing the exciting cause. If an attempt has been made to save the limb, and it be frustrated by the formation of extensive abscesses, (or by diseased bone, causing frequent returns of inflammation,) or by extreme prostration of strength with the urgent symptoms constituting hectic fever, amputation will probably become necessary. The time for such an operation will depend on the reparative powers still remaining. If the strength be too impaired, to admit of the delay necessary for exfoliation, amputation must be performed. It seldom appears that the patient is too weak for the operation ; nevertheless, where it becomes necessary, it should be done without delay. It is astonishing how much depression and weakness the patient will recover from, when the exciting cause has been removed. This is observed in cases where diseased bone has been thrown off, which, from its irritating presence, had kept up a profuse discharge and urgent symptoms.

It may be mentioned that in some cases of extensive discharge of purulent matter, accompanied by hectic disturbance of the system, much good has been derived from substituting cold spirit wash for warm applications. The diminution in the

quantity of discharge has been extraordinary, and not unfrequently has the urgency of the symptoms disappeared after its use. By the beneficial results arising from it, several limbs were saved, which it was feared must have been sacrificed to preserve life. The cases alluded to are those in which it becomes a question as to the power the patient has to contend against the depressing effects of suppuration and irritation; the surgeon feeling satisfied that, if there be sufficient stamina to withstand the effects of the discharge, the patient will recover. Where, however, the injury is of such a character as to preclude the possibility of saving the limb, and amputation becomes a mere question of time, the first favourable opportunity must be embraced for the operation.

ART. II.—*Extracts from an unpublished work on the importation and propagation of Plague and other contagious Diseases.* By Dr FERGUSSON, Inspector-General of Army Hospitals.

HOWEVER unphilosophical it may be deemed, there appears to me good reason to believe, that diseases in their origin, beyond all doubt non-contagious, may temporarily acquire that property from generating a contagious atmosphere amid multitudes of the sick, and high concentration of the original cause in the progress of an epidemic. The form of fever denominated plague is unquestionably a disease of climate and season, endemial of the land of Egypt and the Upper Levant. Its contagion has of late been much disputed, and it must remain a mooted question, until the great plagues of London, of Marseilles, of Moscow, and many others, both in ancient and modern times, can be better explained than they have hitherto been. Let us confine ourselves to the latter eras, as being better within the scope of our investigation, and here, taking the comparatively recent one at Marseilles into consideration, it would appear from the *Quarterly Review*, that the ship which was supposed to import it there underwent a regular quarantine of twenty days, when no disease appearing amongst her people, she was allowed to land her passengers and goods. To make an accurate investigation of the facts of the case, amidst all the prejudices and panic that it has ever since excited, would now be impossible. Luckily, the still more recent case of the plague at Malta and the Ionian Islands presents itself under more favourable circumstances for investigation than we ever before enjoyed, and to that let us now direct our attention. Its introduction there from Egypt in the year 1813 may be accounted for

from similarity of soil and climate, either giving origin to the disease in certain peculiar seasons and localities, or affording ready receptacles to the contagion when once introduced. The *San Nicolo* (the guilty vessel), not attempting to conceal what had occurred on the passage from Alexandria,* gave herself up at once to the quarantine authorities at the lazaretto. Every possible precaution was used; yet, notwithstanding, did the plague spread amongst the inhabitants, the same as if the importer had been a common merchant ship unsuspected and freely communicating with the shore. True it is, that, while this was going on, there were ominous signs of an epidemic constitution of the air at Malta. Glandular suppurations were taking place from the slightest irritations at the extremities of nerves on the surface of the body, and all manner of wounds and ulcers exhibited an unkindly aspect. It may be quite true that the plague had not been seen at Malta for 137 years previously; but that only goes to prove that it had not been introduced when the aforesaid constitution of the atmosphere chanced to prevail, without which it must have been extinguished through the excellent precautions that were adopted, and could not have spread in the way that it did. But now we come to grapple more nearly with the question—of what use can quarantine possibly be under such circumstances? Did it save the people, and can it save them should the same occur again? These questions are answered by the facts of the case;—they were victimised. But Malta, being a part of our own dominions, and affording a more intimate knowledge and better acquaintance with the disease in question than we ever before possessed, her case demands more accurate investigation.

In the year 1813, that island with its warlike garrison, then the best appointed military government in the world, was armed to the very teeth against the importation of plague;—all the arms were brought to bear, and all had fair play. The importing ship, while her crew, then healthy,† were locked up in the strictest quarantine, was promptly remanded to Alexandria without farther disease being communicated in any way to the fresh crew (stated to be a full one) who navigated her back, and afterwards unloaded her in that port. The season of epidemic plague had, it would appear, passed away there in the interval, and therefore they were safe even in their own infected ship. In Malta, the climate being different, as wanting at that season of the year the high temperature necessary for the dissipation of plague, or the low for its extinction, the disease did not altogether disappear till the com-

* Two men died on the passage, said to be of the plague, and the fact has never been denied.

† The captain of the ship certainly died suddenly after being placed in quarantine, but it never has been asserted, even by the strongest partizan writers, that his disease was the plague.

mencement of the winter season. The native inhabitants were the principal sufferers, being weakly and ill fed, compared with the British military population, and, as we see amongst our own people at home in the case of typhous fever, wherever the constitutional stamina are naturally feeble, or have been deteriorated through any cause, the disease will there, in preference, take its hold. I am not denying contagion, but that contagion must have been aided by a favouring condition of atmosphere, without which it never could have left the well guarded lazaretto with its triple wall, but have gone out, as it did at Alexandria, for the reason above-mentioned. It was, however, brought ashore; how, we cannot tell, and spread itself amongst the inhabitants generally. The quarantine staff declared it must have happened through some undiscovered, and, under the circumstances of Malta, we may add, undiscoverable breach of quarantine. Dr Calvert, Physician to the Forces, who was then on the staff at Malta, and who wrote a most excellent account of its plague in the sixth volume of the *Medico-Chirurgical Transactions*, tells a different story. "I observed," says he, "during my residence that every whitlow festered, and every scratch became an ugly sore, although many of these were accompanied with little or no fever; a tight shoe was sufficient to produce a livid boil with symptomatic bubo. Many cases of this nature occurred in respectable individuals and staff-officers, while the military hospitals were crowded with them." Then he gives a nominal list of no fewer than 27 of these glandular cases that occurred in the 14th regiment alone, between the 20th of June and the 22d of October, every one of whom, it may fairly be presumed, was pestilentially affected, but, being without fever, short of the degree that made it contagious. This has frequently been seen in plague countries where personal attendants have often been found with similar buboes without communicating any infection to those they waited upon.

These, one might suppose, would have thrown some light on the subject of the pestilential contagion amongst the inhabitants subject to all the privations of quarantine, but that would not have satisfied its officials. The following story was therefore got up for the edification of the sufferers. "About this time a woman at Nasciar, where the plague had not existed for three months, was attacked in the following manner. She was brought to bed in the beginning of December, but, before she had time to recover from her indisposition, her husband compelled her to get up and wash his pantaloons. Being fatigued with the exertion she drank a good deal of wine; this was soon followed by flooding, and that, which suddenly ceased, by a violent fever, attended by a bubo in the groin, and she expired on the following day. In this instance the infection was accounted for in the following manner. A not-

ed smuggler, who had been kept a long time in observation, and afterwards liberated in consequence of no marks of disease appearing upon him, had been drinking a short time before the accident with this woman's husband, when it was supposed he came in contact with the identical pantaloons the woman had washed."

Here we are seriously asked to believe that the poor woman's childbed, from which she was forced to get up and employ herself in washing, the subsequent flooding, and its sudden suppression through drinking a quantity of wine, were all, under the aforesaid circumstances of the case, to go for nothing; and that her husband, himself healthy all the while, brought her the plague from going to drink with another healthy man, suspected of being a smuggler, with whom, it is supposed, he might have rubbed pantaloons. Was ever such a story before attempted to be imposed upon full grown men with beards upon their chin! It would scarcely have passed current in a monkish legend of the last century, and by all men whose reason had not been obscured by panic or prejudice, would be rejected as utterly childish. Taking the state of the military hospitals into consideration, would it not have been better to have candidly admitted that a contagious plague atmosphere, how generated we could not tell, had fallen upon Malta, than to have resorted to such puerile fiction, as Dr Calvert has described? As if this was not sufficient to prove infection from communication, it was given out that the shoemaker, Salvator Borg, one of the earliest sufferers (I still quote from Dr Calvert) had purchased some new linen to line shoes with from a Jew, which linen had been brought from Alexandria; but the Jew had always been in perfect health, and the linen in question had undergone the full process of quarantine and purification at Zante. Dr Hancock quotes another case from Tully's account of the plague at Malta and the Ionian Isles, where an old woman, who had received some pieces of money wrapt up in a bit of calico, for the purpose of being thrown across a stream of water, was not taken with plague herself, but some time after communicated the disease, which she never had, to her daughter, &c. Surely after these I need not go on with stories of "imaginary thefts and contraband transactions," of the smuggler's mission under cover of the night, to bring the pestilence in some box or bale from the infected ship, despite of all the guards that surrounded her; but these are answered at once, allowing the smuggler's to have gone on such an expedition, by the fact, that boxes and bales of that kind have been opened out in countless thousands at the lazarettoes of Britain for almost a couple of centuries, and are being so opened now, without ever communicating plague in a single instance, even to those employed in opening them. One wonders that the washerwoman has never been employed to bring the plague ashore instead of the smuggler.

The latter has no business with the fouled linen and infected bedding of the diseased. For obvious reasons, they would not serve his purpose ; his prize is the compact portable handy package, which, as we shall presently see, can never convey infection ; the more bulky ones, such as the above, that might prove contagious, would betray his errand, and these, I need scarcely say, he never touches.

In various publications upon the plague of Malta, we are asked to believe that actual contact was so essential to the propagation of the disease, that military hospitals were formed in the upper stories of a building, while the lower were the abodes of most concentrated fatal plague, without ever infecting the former ;* that in villages, and portions of villages, where it was necessary to form cordons of troops, the men would be placed within a few feet of the infected quarters, and contract no illness, although living for weeks continuously on that duty. "Credat Judæas non ego," I say emphatically. That they held no communication by contact under such circumstances is absolutely incredible. The prowling prostitute would throw herself in the way of the soldier under cover of the night, and the starving female of a better class, under the cruel privations of quarantine, would seek the wages of prostitution. No supposable enforcement of discipline could prevent this. Soldiers are but men ; in regard to their health the most reckless of men ; and we all know the Latin adage,—*Naturam expellas furca, &c.*, what then saved them ? The British rations ; their European stamina ; regulated cleanliness ; and general discipline. These availed to save the French army in the very land of plague, while on its march into Syria it was quartered in the infected villages of Egypt, in the way that troops on a march without tents always quarter themselves ; that is, turning the inhabitants out of their beds and houses without ever contracting plague in an epidemic form. When stationed in the vicinity of marshes the plague actually assumed an intermittent form, which was always left behind when the troops marched away. The English army, at the very plague season of the year, never knew it but as a sporadic disease ; and although the Indian native force that joined from Bombay suffered somewhat more than was to have been expected from the description of troops living upon vegetable diet, and refusing animal food. I am not pretending to deny the contagion of plague under certain circumstances of temperature and season, without which it is nothing, for its disappearance at the summer solstice in Egypt can be calculated upon almost to a certainty. The malaria that produces it must be peculiar to the soil of Egypt, for there it is indigenous. Other Mahometan countries have occasionally a long respite. In Egypt it is as much an en-

* Vide Hennen and others.

demic as the yellow fever is in the West Indies, and has been so from the earliest records that we know of. Why a malarious disease should be transportable and contagious I cannot tell, and, if the fact be so, it would be vain to speculate upon the reasons. Other diseases that in themselves have no contagion belonging to them may acquire that quality temporarily from the accumulation of crowded sick; and where there is contagion, the fomites of the sick may retain it for an indefinite length of time. The miserable fellahs of Egypt, and the lazzaroni of Mahometan countries, to whom changes of body covering are little known, may thus retain the infection about their persons and dwellings, until the season for fresh explosions returns, and in this way it may be made perennial.*

Much has been written and believed upon the security derived from what is called shutting up by Europeans; but the exposure of the closest cordons with impunity, as at Malta, shows that this security resides in the European constitution, and not in the avoidance of contact. Even the most rigorously secluded, however, at times fall victims, and when the contagionist is at his wit's end to prove communication, he falls back upon the cat, (*vide* Assalini and others,) or other domestic animals. She, to be sure, is a wanderer within her own circle, but she shuns strange places, and her nocturnal assignations are conducted upon our house-tops and other out-door premises. Why the rat should not also have been suspected seems strange; for he is a bold intruder, often coming from afar, as I have often found to my no small disquiet, to thrust his nose where he has no business; and the cat in her vocation pursuing the rat, may thus gratify the disciple of actual contact with a double allowance of what he prizes so highly. It surely would have been more in accordance with the rules of evidence to denounce the flies and winged insects that inhabit the atmosphere, than a useful domestic quadruped. These constitute aerial intercommunication between man and man, and may act a part in the transmission of contagions, of which as yet we know but little, but they can neither be destroyed nor quarantined, and as they would answer no one's purpose, have always passed unnoticed.

The manlike and vigorous mind of Sir Thomas Maitland, who then commanded at Malta, was so imbued with the delusion of

* The plague of Egypt, however, is an affair of season altogether. When the time arrives, were we even to woo its stay we could not retard its departure a single hour. It is then that the fugitives of the pestilence return to their dwellings. The beds from which the infected have just risen, or been carried, are occupied without purification and without risk, and the personal clothing of the dead is in the same way transferred to the living, without ever affecting their health. Saint John's day is past and there can be no fear; nor will it do to say that those who have thus escaped were insusceptible of the infection-contagion proof, for when the plague at its proper season returns with the succeeding year, they have often been found its first victims.

actual contact being the sole means of propagating the disease, that in a dispatch dated April 1819, which he subsequently addressed to Lord Bathurst, he justifies his having resorted to measures of quarantine at the cost of such sufferings as he thus so forcibly describes. "For there is no denying," he says, "that the treatment of plague under the ancient system is one attended with a degree of cruelty and tyranny unparalleled in the annals of the world, and only to be defended on the principle of positive and ascertained necessity. This system cuts up by the roots all those feelings of domestic life which are peculiarly endeared to the mind of man in a moment of sickness and distress; rends asunder the bonds of society, and places the unfortunate patient in a situation of the most desolate isolation at the moment when the only remaining comfort of life exists in the kindness of natural friends and connections. The quarantine law, too, in the instance of the plague actually existing, is not only most arbitrary in itself, but to the full as indefinite as it is arbitrary, and the whole of the circumstances attached to it are so revolting to the feelings of every man, looked at in any way, that I apprehend that this is one of the principal reasons why, in almost every instance that can be mentioned, this fatal malady is allowed to arrive at a great height before it is even declared to be plague; and in the two great instances of the plague at Messina and Marseilles, we accordingly find that no reliance was placed on its being the plague till it got to that dreadful head that occasioned those miserable scenes which afterwards ensued. The same was considerably the case at Malta at the breaking out of the plague, and it cannot be astonishing to any man who has seen it, that even the last dregs of hope must expire before any society can submit patiently to a system of discipline which can be stated at best as only an inferior evil to the plague itself. The quarantine laws under the same system, with the view to prevent the introduction of plague, are attended in all instances with evils of great magnitude, and most of all in the very serious effects it universally has upon *the commercial relations of different countries*. It would be most fortunate, indeed, if it could be made out that the world had been hitherto mistaken with regard to its character and origin." And I verily believe that the world has been in many respects greatly mistaken. The experience of the French and English armies in Egypt decidedly proves a negative of actual contact being either the sole originator or indispensable propagator of the disease, for the closest contact did not give it to the first, and the escape of the military at Malta, while in such near approximation as has been described, goes to show that the non-contact so much relied upon must have been in great part a fiction of the self-deluding mind. It did not; it could not exist for so many months under the circumstances of

Malta without the cordons being infected. *Quis custodiet custodes ipsos*, is a fair question, and that they did not on their return to their regiments, spread the infection among their comrades in a marked degree, ought to be sufficient answer to those who insist the disease can never be propagated but from personal communication. Always avoid unnecessary personal communication as much as possible. It would be unwarrantable to act otherwise; but when we see the disease spread as at Malta, despite of seclusion and cordons and quarantines, yielding to nothing but a change of season, let us spare the additional infliction of the cruel laws so admirably depicted in the above dispatch of Sir Thomas Maitland. These laws have too often caused men to be mercilessly shot on their own thresholds, or hung up before their own doors, to the great exultation of the quarantine authorities; and if done needlessly, in obedience to a baseless superstition, what shall we say to their guilt?

One wonders that the ultra-contagionist does not see how much he damages his own cause by insisting on the indispensableness not only of personal communication, but actual touch. This would make plague almost like itch, a strictly inoculable disease, and had this been the case at Malta, it must, with the pains taken, have been put out twenty times over, I may say, in the course of the six months it prevailed there; but what means in the power of man can extinguish an atmospheric or endemic disease? In the histories of divers plagues there are evidences of hundreds, I may say thousands, being infected in one day; and will any one pretend to say that all these took it from touching one another, or that anything but a contagious atmosphere could have made the infection so diffusible. This atmospheric contagion exists oftener than the quarantine practitioner is willing to acknowledge. It would destroy his trade, and therefore he has always cried it down. Believe him, and the laws of the atmosphere will ever continue an unread book;—the qualities of soil uninvestigated,—the course of the winds unnoticed,—aspect of country;—perflation, temperature are to go for nothing. The moral condition of its inhabitants—their sympathies and tendencies can be of no account—all are to be superseded by the one antisocial mandate, keep your distance. There can be no danger while pestilence rages, but in the approach of your fellow man. He alone is the enemy you are to avoid. So does not think and act the despised unlettered Turk. He will not desert his child, or abandon his parent, when struck with the pestilence; nor will the wife fly the couch of her dying husband. It has been reserved for enlightened Christians thus to exhibit themselves, bereft of reason through fear; for if they permitted themselves to read and to think, they would find that the abandonment and excommunication of the sick never yet, in any

plague country, influenced the progress of the disease. It lasted just as long, and departed just as certainly, at the proper seasons, whether the victims had been tenderly nursed, as in Constantinople, or inhumanly abandoned, as in the great plague of London. Both the French and English armies, while serving in Egypt, took every care of their plague patients, but, notwithstanding all the unavoidable necessary intercourse, they could not at any time force it into an epidemic form, nor prevent its recurrence when the plague season returned with the revolving year, nor retain it, I may almost say, a single day after that season has passed away. When plague first breaks out in oriental countries, it would appear to infect almost all who approach the sick—when departing—no one. And does not this proclaim, as plainly as the eternal elements can speak, that the disease resides in them, and that contagion can never be more than an occasional attribute; for, let the quarantine master rave, and legislate, and torment as he will, he can neither obviate, nor retard, nor turn its course. All will be done for him in obedience to the eternal laws of climate, and season, and soil, over which his assumption of control would almost be impious, were it not ridiculous.

Let us now turn to the terrible plague of Moscow, where it appears that after all separation of the sick from the healthy had been practised, and burning of clothes and moveables had been effected, yet did the disease break out in fury after a cessation of three months, and ceased not until the people had risen in insurrection against all restrictions, and given the freest scope to the disease. Surely, it ought, then, according to all the laws of progression, to have infected the whole empire, and through its fomites have implanted the disease *in perpetuo*: but no! it straightway went out, and has never been heard of since. I am not pretending to deny the existence of contagion in the disease; I only wish to show the impotence of quarantine, when moral and atmospheric agencies lend their aid to its spread. Keep it out if you can. At Malta it has been shown that you could not; but divest your precautions of much of the absurdity with which they are clothed, in regard to merchandize of every kind; for it must be impossible that anything can communicate the disease, which has not been long in intimate contact with the bodies of the sick. It must, moreover, be of soft absorbing texture, for no hard substance can ever retain the fomites of contagion, through which alone could it be carried from one place to another; but even this danger may now be considered as visionary—for amidst the thousands and tens of thousands of vessels that, during the last 150 years, have imported their cargoes into our lazarettoes, there is not a single instance of infection having been communicated to any of the officials. They go through the imposing farce, however, with

grave face, but it is a farce, acted not for the safety of the people, but for their own benefit. Is it possible any one can believe that articles of wool, cotton, hair, leather, paper, or anything else packed in bales, can communicate infection while they are feeding their children with the figs of Smyrna, that within few weeks have been gathered, not improbably, with pestiferous hands, or have their rooms furnished with carpets straight from the looms of Constantinople. Personal clothing or bedding is different, for if worn throughout the disease, it must have become saturated with the accumulated poison, and if contagion can exist at all, it must, until purified, be there. The rule here differs from that of yellow fever.* In the last it was places not persons. In the plague it is persons, or their fomites, not merchandize or goods. If we admit contagion at all, we must not permit ourselves to be regardless of its fomites, for these, in the accumulation of a saturated garment, may be carried, I should, think, as far, and for as long as the extravasated matter of small-pox can be made to serve the purpose of an inoculator. These, however, if proper means be used, can be disarmed of their infectious power far more easily than the concentrated matter of small-pox can be deprived of its virus. Their disinfection, as I shall presently show, is easy, but till then, they ought in all good health police to be held dangerous. How else can we account for the revival of small-pox, scarlet-fever, and other contagions after long cessation, but in the unpurified flock and feather-beds of this country which retain the contagion till susceptible subjects and peculiar seasons call it again into operation? In many parts of the continent these are subjected to annual purification. Here at home they often remain untouched for as long as they can hold together, no matter what diseased bodies may have lain upon them. Ventilation can never be made to visit, or the light to penetrate their interior. Can we then wonder that they should retain, it may be for years, the seeds of infection?

To deny contagion altogether is bigotry as untenable as ever possessed the human mind. The simplest shepherd or drover of cattle knows better. He is well aware that infection can be carried by the living animal to any distance, and that the safety of his flocks and herds depends upon guarding them against the dangers of communication. But, independent of this, may we not have been deceiving ourselves when we attempted to define the distance to which contagion can extend from the sick-bed? The epidemic spread of plague, small-pox, scarlatina, &c. will otherwise always remain a mystery whenever they have by any change or introduction been called into existence. Until disarmed first by inoculation, and, subsequently, by vaccination, small-pox was by far the most fearful of human contagions, and it now exerts its fury,

* Fully discussed in another place.

exactly in proportion to the novelty of its introduction, and the simple lives of savage tribes, amongst whom it had previously been unknown, and to whom it never could have been conveyed, but through its fomites. In civilized life the virulence of the contagion is more easily disarmed, and civilized man never suffers from it to the same extent as the Indian or the negro. It was only, as is were, the other day that intelligence reached us of a whole tribe of warlike Indians, on the descent to the shores of the Pacific, having been utterly extirpated by the introduction of this scourge. Alcohol had before that been slowly doing the work of extermination. Small-pox accomplished it at one single blow.

The variolous contagion seems, moreover, to act equally in all climates, seasons, and localities. It will spread, if once introduced, as easily under the equator, as within the bounds of the arctic circle. Unlike the plague, it has no cessation for as long as susceptible subjects can be offered up, and of all diseases it should with the greatest propriety be made the subject of quarantine; but while we keep on enforcing it against the visionary dangers of plague, we cannot, we dare not, apply it to this domestic pestilence ever raging under our very nose. This last can be of little avail in guarding against diseases that are known to be as much atmospheric as they are personal and contagious. To look for security for such a safeguard against them is to shut our eyes to the true nature of the danger, and lie down in apathy under the false belief. Domestic health, police, and public sanatory precautions, such as those directed under the Drainage Building Bill, recently passed through Parliament, can alone save us from the invasion, or preserve us in a fitting state to meet the evil when it arrives. There was a time before the great fire of London when the plague appeared in our metropolis every twelve or fifteen years. It has not now been seen there for nearly two centuries. At Malta and the Ionian Isles, it may, through vicinity to Egypt and similarity of climate, have shown itself oftener, but in our own case, where there is no such similarity, if experience so lengthened and strengthened can be good for anything, it must show that quarantines upon merchandize are as vexatious as they are nugatory, and that those upon living importation may be modified without risk.

To conclude the subject of quarantine, we may fairly say, that, from the invasion of true contagion, it never yet has saved us, and that, when introduced, it has added tenfold misery to the already afflicted community. When the plague pervaded London in 1665, the institutions of quarantine, through excommunicating the miserable sick, converted every infected house into a depot of the accumulated poison, which, being there entrenched and implanted, defied purification, and by regularly infecting the proximities,

made its onward progress sure to the hitherto untouched quarters of the city. This is the case in true contagion; but what shall we say to a recent case, that of Asiatic cholera, where no actual contagion exists; where the people, if they are to believe the health authorities, are thrown at once into a state of mutual excommunication, every domestic tie set at naught, every social bond severed, and men, at all other times social and humane, made as selfish and cruel as the inhabitants of Ashantee or New Zealand? Under the paramount instinct of self-preservation, the appeals of reason and humanity will alike be given to the winds, and the terror-struck fugitive of the pestilence will shut his doors as close as his heart against those who cry to him for succour;—and can all this hideous manifestation of cowardice and selfishness be the work of one man or department of men? It can, if we are to believe the health-preservers. Cry contagion any where and it will happen to-morrow. When the Asiatic cholera prevailed, which is as much a contagion as the thunder storm, scenes were enacted through every quarter of Christian Europe which ought to make man ashamed of his species. In our own Christian country, shipwrecked sailors were stoned upon the beach, under suspicion that they came from infected countries; and wayfaring women, taken with the pains of labour, were thrust from the outhouses where they had sought shelter, and committed to the tender mercies of the public highways. *

These are sad degrading histories; but what shall we say to them if they were enacted in the case of an atmospherical visitation, against which they were as powerless as if they had been directed against the east wind; but, even supposing true contagion to exist, would excommunication of the infected be the best way to mitigate its terrors and bring about its extinction; or would it not, on the contrary, give it tenfold force through the inevitable evils of accumulation and the terrors of desertion? Fly the place, certainly, and make all fly who have the means, but to those who

* An instance of the first occurred at Kirkintulloch, in Scotland, and one of the last in Ayrshire, of which I was all but an eye-witness, as it happened in the neighbourhood of a family residence where I chanced at the time to be sojourning, and I afterwards took an active part in the investigation of the atrocity. Be it remembered, moreover, that on both occasions the people concerned were at all other times the kindest hearted in the world. On the Continent, whenever cholera appeared, the frenzy of the people was even more uncontrollable. Enlightened liberal France was as much possessed with the delusion as semibarbarous Russia. Poisoned wells, poisoned bread, poisoned medicine, all found believers. The faculty, in some places, were sought to be massacred; in others, they were made to drink their own disinfecting chlorines until they died from the chemical poison; and really, when we consider that, in the first place, they were instrumental in converting Christian men into insane demons through the cry of contagion, we feel almost warranted in saying the persecution was not altogether undeserved. Let them from this never forget hereafter that, whenever they may succeed in lashing the people up into a similar wild panic, they will themselves, in all probability, be made the first victims.

remain, extend the succours of humanity, and those who visit the sick may be assured that they will ultimately run less risk in saving the infected from the accumulated poison of the disease, than if they had left it to be diffused uncorrected and undiluted amongst the people. The sick in every instance should be proclaimed wards of the community, to be registered, fed, attended, and succoured; the general safety requires it; for there is scarcely any contagious disease that may not be visited with safety, and treated under due precautionary observances. Excommunication alone will make it truly dangerous, and when man, in his impotence, resorts to that terrible weapon, he arms it against himself with powers that it never could have possessed, had it been treated in accordance with more benevolent principles. Leave it unsuccoured, and then will contagion, like the mass of the hurricane, circulating at first within its own lines and limits (*vide Reid's Law of Storms*,) at last acquire onward power that can only be controlled by changes of the elements, or failure of susceptible subjects on whom it may act; but succour it early and well, the sting will be drawn, or its venom so diluted, that even in its early stages it will be disarmed of half its terrors, and towards its close go out like the dying taper that has never been fanned into a blaze with the preposterous fuel of accumulated contagion. The great Plague of London for months before the grand explosion passed nearly unnoticed, and did not acquire body or power until the health preservers interfered not to succour but to excommunicate. Then it was that every suspected dwelling was converted into a pest-house; a depot of the deadly contagion. The cross upon the doors was then nearly as fatal to the proscribed inmates as the cry of mad dog in the streets would have been to the luckless quadruped. Who then would dare to succour, at the risk of having the same brand of death affixed to himself, and how could the contagion be diluted, modified, and extinguished, but by the timeliest succours? To these alone, under an enlightened superintendence, can we ever again look for deliverance, in the event of plague, or other deadly contagion, being introduced amongst us.

In the case of yellow fever, so often and so absurdly made the subject of quarantine, there has always existed a strong undercurrent of unbelief throughout the West Indies, which made the quarantine master impotent in the social circle, and only caused him to be formidable, as a false herald proclaiming imported contagion from abroad, in vindication of the community that had employed him to defend their local character and interests from the imputation of endemic pestilence. The Hankey, the Dygden, the General Elliot, and hundreds of others have all been made to serve the purpose, and will be made for as long as quarantine

against the impossible contagion exist. At Vera Cruz and New Orleans, in whose deep and deadly swamps the yellow fever is as much an annual as the plague is in Egypt, they would laugh the importer to scorn. Its hitherto unaccountable cessation and absences from the West Indies, some of them for a course of years, while the importation of strangers from Europe remained the same, and the seasons exhibited little appreciable difference, have alone armed the quarantine authorities with power to deceive and to impose.

The vindication of the truth has been long in coming, but it surely will come although many have despaired of it; and the venerable Dr Jackson,* who spent great part of his life in illustrating, by his labours, the etiology of yellow fever, was at last, in despair, obliged to confess that he had been labouring in vain. Even now quarantine and contagion ride triumphant. The medical officers of the service, greatly reduced in number, scattered, and unsupported, are frowned into silence by an array of power which it would be dangerous to oppose, and the schools keep pouring forth the young and ardent disciples of the true faith, before whom the heresy of non-contagion is constrained to hide its head. When armies are again in the West Indies, and the cloud of witnesses on part of the last becomes irresistible, the contagionists will probably again be silenced; but they will bide their time, and with the Treasury and the schools to back them, resume their gainful course wherever panic can be spread, and the consequent restrictions imposed.

ART. III.—*Pathological Contributions*. By R. BOYD, M.D.,
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Practice of Medicine. (Continued from Vol. lviii. p. 112.)

IN the present communication three cases are added to those already given of diseases of the VASCULAR SYSTEM; the commencement of the diseases of the RESPIRATORY ORGANS occupy the remainder; these include, pulmonary apoplexy, cancer, affections of the larynx, bronchitis, and pneumonia. The cases of

* In a work published by him in the year 1817, he thus expresses himself: "The quarantine law is an engine of the state, and, like other of the ordinances of power, it is so sacred, that to attempt to prove that it had been made without cause, or that it is maintained contrary to reason, would be labour lost, if not penalty. It must, therefore, remain as it is until the Lords of the Council become philosophers."

In the foregoing I have always used the words contagion and infection contagious and infectious, as precisely synonymous terms, for the reasons stated in another part of the work.

bronchitis, with one or two exceptions, as well as those of pneumonia, are included in tables 1 and 2, page 34, et seq.

CASE 158.—*Enlargement of the Heart and valvular disease, Pericarditis, Pneumonia, Bronchitis, diseased Kidneys, and Dropsy.*—Male, aged 55, a servant, for some years asthmatic. Admitted six weeks before death, with ulcers on left leg, and general anasarca. The dropsical symptoms gradually increased; urine albuminous; orthopnoea for several days before death; and ecchymosis in large patches on feet, legs, and backs of the hands.

Appearances.—Brain normal.

Chest.—Old pleuritic adhesions on both sides; pulmonic pleura much thickened, and tissue beneath it infiltrated with fluid. Lower lobe of right lung indurated, and a portion of the lower lobe; left, in a similar state; right lung weighed 46 ounces; left, 39 ounces. Pericardium sticking to heart, serous surfaces of each dry; a thin layer of recent lymph nearly covering them. Heart enlarged; mitral valves thickened; aortic semilunar valves contained ossific matter, fibrine in considerable quantity adherent to their margins, in some places softened; a round firm projection, as large as the top of the little finger, between the posterior semilunar valve and aorta. On opening it some brown semifluid matter escaped; weight of heart 22 ounces.

Abdomen.—Contained about one gallon of straw-coloured fluid. Liver large nutmeg, old peritoneal adhesions to convex surface of right lobe; weight 59 ounces. Spleen enlarged, capsule thickened and rough on surface from semicartilaginous deposits; weight 16 ounces. Kidneys pale, granular; capsules readily peeled off, ordinary size.

CASE 159.—*Enlargement of the Heart, and large openings in the auricular septum. Pulmonary tubercles, Pneumonia.*—Female, aged 57 years, married, subject to anasarca, but which always yielded to remedies; of rather a florid complexion, but no blueness whatever of countenance.

Appearances.—Head.—Brain normal.

Chest.—Pleuritic adhesions, especially on the right side; lungs contained a few tubercles; induration of lower lobe right lung, weight $26\frac{1}{2}$ ounces; left $17\frac{1}{2}$ ounces. Heart enlarged, cavities dilated; an opening in the auricular septum, in the situation of the *fossa ovalis*, extending one and a quarter inches from before backwards, and half-an inch in the opposite direction. Two membranous bands extending from the upper to the lower portion of auricle, divided this opening into three unequal parts, smallest behind, largest in front. Mitral and tricuspid valves large; weight of heart $18\frac{1}{2}$ ounces.

Abdomen.—Liver large nutmeg; weight 64 ounces. Stomach $6\frac{1}{2}$ ounces; spleen 6 ounces; kidneys small, $7\frac{1}{2}$ ounces.

CASE 160.—*Aneurism.*—Female, aged 68, whilst in her usual state suddenly complained of sinking, and died almost instantly. Her death was the subject of a coroner's inquisition.

Appearances.—*Head.*—Brain normal.

Chest.—Lungs; old pleuritic adhesions on both sides; heart and great vessels encroached considerably on left lung.

Heart.—The opposing surfaces of the pericardium glued together by a layer of fibrine, except on left side, where they were separated by a clot of blood weighing 3 ounces. An aneurism was found proceeding from the inferior portion of the arch of the aorta descending towards the base of the heart, its parietes firmly adherent to the origin of the aorta, pulmonary artery, and right auricle, beneath the appendix of which there was a small opening communicating with the cavity of the pericardium. The effusion of blood must, in the first instance, have been gradual, as the fibrine was almost in a state of purity, presenting all the characters of that so frequently found after death in the cavity of the heart; the effusion of fibrine was pretty equable, about one-eighth of an inch in thickness, uniting the surfaces rather firmly, except where the clot of blood was interposed, the sudden effusion of which was probably the immediate cause of death. The aorta was considerably dilated betwixt the seat of the aneurism and the heart; its coats were thickly studded with bony deposits, as also the arteries of the body generally; heart was enlarged, weighing 17 ounces.

Abdomen.—Liver; hepatic congestion; gall-bladder contained mucus void of colour, and a number of gall-stones, one of which was firmly impacted in its neck, so as totally to prevent the entrance of bile; all the other viscera normal.

CASE 161.—*Pulmonary Apoplexy; Hemiplegia of the left side.*—Male, aged 78, was brought into the Infirmary in a state of insensibility. It was said that he had had an attack of vomiting of blood, which continued for two days and then ceased. Slight cough; swallows his expectoration; sinking; died four days after admission.

Appearances.—*Head.*—*Brain.*—An old apoplectic cyst in right *corpus striatum*. Considerable effusion in the lateral ventricles.

Chest.—*Lungs.*—Pulmonary apoplexy of the lower lobe of right lung; old pleuritic adhesions of the lower lobes of both lungs; some effusion into both pleural cavities; right lung weighed 31 ounces; left 16½.

Abdomen.—Liver 40 ounces; spleen 1½ ounce; all the viscera normal.

CASE 162.—*Croup.*—Female, aged 4 years, admitted three days before death, with ringing cough and other symptoms of

croup, which appeared to decrease in severity; whilst sitting up in bed taking a drink of milk, suddenly died from asphyxia.

Appearances.—*Head.*—Brain normal.

Chest.—Larynx lined by false membrane, which extended from the *rima glottidis* down the trachea nearly to its bifurcation.

Lungs. Bronchial tubes nearly filled with muco-purulent secretion, no redness or thickening; the lungs presented a natural appearance; right weighed $2\frac{1}{4}$ ounces; left $2\frac{3}{4}$ ounces.

Abdomen.—All the organs normal.

CASE 163.—*Croup, Laryngitis.*—Female, aged 10 months; no history of case; brought in previous to internment.

Appearances.—*Head.*—*Brain.*—Dryness of arachnoid, otherwise normal.

Chest.—Larynx and trachea, as far as its bifurcation, lined with false membrane; redness of the mucous membrane lining those parts; congestion of both lobes of the lungs; right weighed $3\frac{1}{2}$ ounces; left $3\frac{1}{4}$ ounces.

Abdomen.—Organs normal.

CASE 164.—*Croup, Measles.*—Male, aged 4 years, symptoms of croup were observed as the eruption was disappearing, and became very urgent; the usual treatment was adopted; the symptoms abated; the child appeared much better, and could swallow. It suddenly became pale and faint, and died without a struggle.

Appearances.—*Head.*—*Brain.*—Some congestion; weight, 36 ounces.

Chest.—Ulceration of *rima glottidis*; larynx filled with muco-purulent fluid; three small ulcers were observed. *Lungs.* Some congestion of lower lobe of left; redness of bronchial lining membrane.

Abdomen.—Enlargement of mesenteric glands; softening of mucous membrane of large intestine; follicles presented some appearance of disease.

CASE 165.—*Croup, Pertussis.*—Male, aged $2\frac{1}{2}$ years, was affected with pertussis a fortnight before symptoms of croup were observed; died suddenly.

Appearances.—*Head.*—*Brain.*—About one drachm of clear fluid in lateral ventricles; some congestion of substance of the brain.

Chest.—Irregular deposit of firm lymph upon lining membrane of larynx; epiglottis red and swollen; disease confined to those parts. *Lungs.* Some lobular pneumonia of lower lobe of right, which weighed $4\frac{1}{2}$ ounces; left $3\frac{1}{4}$ ounces.

Abdomen.—All the organs normal.

CASE 166.—*Gangrene of Trachea, left bronchus and portion of left Lung, Pulmonary Tubercles.*—Male, aged 39, suffered from cough and hæmoptysis for one month previous to

admission. Dulness on percussion of apex of left lung; crepitus and strong resonance of right; pulse 130; seven days afterwards fœtor of breath detected, with flattening of chest above and below left clavicle; little motion; clear cavernous ronchus; fœtor of breath increased; pulse becoming weaker; respiration more laborious; teeth covered with sordes; vertigo; œdema of lower extremities; sinking; patient died twenty-three days after admission.

Appearances.—Head.—Brain pale; otherwise normal.

Chest.—Lungs. Both studded with miliary tubercles; more numerous in left lung than right; small tuberculous cavity in apex of left. The whole of the trachea, and about two inches of the left bronchial tube in a state of gangrene, as well as a small portion of upper lobe of left lung. The gangrene was bounded above by the *rima glottidis*; the mucous membrane was entirely destroyed, leaving the rings of the trachea quite exposed, many of them loose and nearly detached; left lung weighed $50\frac{1}{2}$ ounces; right $36\frac{1}{2}$ ounces; heart weighed $8\frac{1}{2}$ ounces.

Abdomen.—Liver in the state of venous hepatic congestion, its left lobe attached to the spleen; weight, 57 ounces; spleen, 11 ounces. The other organs presented a natural appearance.

CASE 167.—*Bronchitis, cancer of the lungs and liver; Icterus.*—Male, aged 69 years; brought in from out of doors. No history of case.

Appearances.—Head.—*Dura mater* yellow; brain normal.

Chest.—Lungs. Firm pleuritic adhesions of right lung; cancer of the bronchial glands extending into root of lung, and involving a portion of the bronchial tubes; redness and thickening of their lining membrane; left lung less adherent than right, a little calcareous deposit in lower tube; weight of lungs equal, $31\frac{1}{2}$ ounces. Heart: fat at its base yellow, cavities dilated; weight 12 ounces.

Abdomen.—Liver enormously enlarged; weight 173 ounces; little of the natural structure left; place occupied by soft cancerous deposits; other organs normal.

CASE 168.—*Cancer of the lungs and bronchial glands.*—No history of the case. Female, aged 65 years.

Appearances.—Head.—Brain normal.

Chest.—Lungs, some inflammation of the bronchial lining membrane; several masses of cancerous disease disposed through the substance of both lungs, of different sizes, and various degrees of consistence; some of the bronchial glands similarly affected; left lung firmly adherent to spine; weight of right lung, $26\frac{1}{2}$ ounces; left $20\frac{1}{2}$ ounces.

Heart.—Two small portions of diseased structure on the pericardium, similar to that observed in the lungs.

Abdomen.—Liver contained several masses of cancerous disease, hardening of upper end of spleen; no disease of intestines.

CASE 169.—*Cancer of the lungs and bronchial glands ; anasarca.*—Female, aged 69. No history of case.

Appearances.—*Head.*—Brain normal, *dura mater* firmly adherent to cranium.

Chest.—Lungs. Congestion of the lower lobe of right lung ; some traces of inflammation of the bronchial lining membrane ; both lungs contained tumours varying from the size of a walnut to a pea, of a cancerous character ; several of the bronchial glands presented a similar appearance ; one was enlarged to the size of an orange ; weight of right lung, $18\frac{1}{2}$; left, $16\frac{1}{2}$.

Heart.—Enlarged ; weight, $13\frac{1}{2}$ ounces ; cavities dilated.

Abdomen.—Liver presented a mottled appearance ; a number of small tubercles in the mesenteric glands ; right kidney enlarged, weight, $12\frac{1}{4}$ ounces ; pelvis nearly filled with tuberculous matter ; left kidney congested, weight, 6 ounces ; two or three small fibrous tumours attached to uterus.

CASE 170.—*Bronchitis terminating in phthisis, emphysema, general dropsy, hæmoptysis.*—Male, aged 35 years ; employment, labourer ; subject to cough from boyhood, which has become gradually worse during the last five years ; mucopurulent expectoration ; complains of pain under the sternum ; pulse quick and feeble ; breathing laborious ; tongue clean ; bowels open ; appetite middling ; dulness on percussion over the whole of the right lobe. About two months after admission œdema of the ankles was observed ; urine diminished in quantity ; dropsy gradually increased ; abdomen, face, scrotum, legs, became hard and swollen ; no albumen could be detected in the urine by the usual tests ; he died suddenly, from an attack of hæmoptysis, about four months after admission.

Appearances.—*Head.*—Brain normal.

Chest.—Old pleuritic adhesions on right side ; apex of right lung rugged from small tuberculous excavations ; a quantity of imperfectly coagulated blood in apex and bronchial tubes ; tubercles in different stages dispersed in masses through the entire lung ; adhesion of left apex to parietes ; it contained a mass of tubercles ; rest of lung pretty free from them ; right lung weighed 37 ounces ; left 39 ounces. Heart pale, of a triangular shape, contained a small portion of semifluid blood, weight 11 ounces.

Abdomen.—Spleen rather large and firm, weighed $7\frac{1}{2}$ ounces ; all the other organs normal ; peritoneum contained a large quantity of straw-coloured fluid.

TABLE I.—BRONCHITIS, (MALES.)

Case 171.—Aged 3 years. For several weeks before death suffered from pertussis.

Head.—Brain normal.

Chest.—Redness of the bronchial lining membrane ; some congestion of the right lung ; weight of right, 3 ounces, left, 2 ounces.

Abdomen.—Mesenteric glands enlarged ; intestinal mucous membrane healthy.

Case 172.—Aged 5 years.

Head.—Brain much congested.

Chest.—Bronchial tubes filled with muco-purulent secretion to their minutest ramifications ; slight emphysema of the edges of both lungs, some hepatization at the roots ; right, weighed 6½ ounces, left, 5½ ounces.

Abdomen.—All the organs normal.

Case 173.—Aged 30 years.

Head.—Brain weighed 50½ ounces.

Chest.—Thickening of the bronchial lining membrane ; general emphysema ; incipient pneumonia of lower lobe of right lung ; weight of lung 63 ounces. Heart weighed 12 ounces.

Abdomen.—Some of the organs enlarged ; spleen weighed 13½ ounces ; kidneys, 11½ ounces ; pancreas, 4 ounces.

Case 174.—Aged 38 years.

Head.—General congestion of brain ; weight 49½ ounces.

Chest.—Redness and thickening of bronchial lining membrane, which was covered with a muco-purulent secretion ; emphysema of the edges of the lungs ; weight 44½ ounces. Heart, 12 ounces.

Abdomen.—Organs enlarged ; liver, 68 ounces ; spleen, 9½ ounces ; kidneys, 14 ounces ; stomach, 8 ounces.

Case 175.—Aged 43 years. For several winters a patient in the Infirmary from affection of the chest.

Head.—Brain weighed 54½ ounces.

Chest.—Bronchi filled with muco-purulent secretion ; congestion and redness of their lining membrane ; emphysema of lungs ; weight 61 ounces. Heart, 17 ounces.

Abdomen.—Organs enlarged ; liver, 66½ ounces ; spleen, 9½ ounces ; kidneys, 14½ ounces ; stomach, 8 ounces.

Case 176.—Aged 44 years. An out-door patient when first visited, in a dying state.

Head.—Congestion of the brain.

Chest.—Old and firm pleuritic adhesions on both sides, especially the right ; bronchi filled with muco-purulent secretion ; thickening of the lining membrane ; lungs weighed 35½ ounces ; heart, 10 ounces.

Abdomen.—Organs enlarged, not generally ; liver, 53 ounces ; kidneys, 11½ ounces ; other organs normal.

Case 177.—Aged 46 years.

Head.—Brain firm, weighed 50½ ounces.

Chest.—Emphysema of upper lobes ; some of the vesicles dilated to the size of a pigeon's egg. Bronchi filled with muco-purulent secretion ; redness and thickening of the lining membrane ; lungs weighed 139½ ounces ; heart, 11½ ounces.

Abdomen.—Organs normal, except spleen, which weighed 11½ ounces.

Case 178.—Aged 52 years.

Head.—Congestion of the brain ; weighed 54½ ounces.

Chest.—Pleuritic adhesions of right lung ; redness and thickening of the bronchial lining membrane of both covered with muco-purulent secretion ; lungs weighed 61 ounces ; heart, 12½ ; right ventricle dilated.

Abdomen.—Organs enlarged ; liver, 74 ounces ; kidneys, 12½ ounces ; stomach, 7½ ounces.

Case 179.—Aged 55 years. Delirium for thirty-six hours before death.

Head.—Congestion of brain ; weight, 42½ ounces.

Chest.—Pleuritic adhesions of the apices of both lungs ; bronchi filled with muco-purulent secretion ; lining membrane red and thickened ; a few tubercles in the upper lobes of each lung ; weight of lungs, 46 ounces ; heart, 13 ounces.

Abdomen.—All the organs normal.

Case 180.—Aged 59 years.

Head.—Brain normal, weight, 53 ounces.

Chest.—Old pleuritic adhesions on both sides; a few tubercles dispersed through lungs, some hard, formed principally of earthy matter, pleuræ covering them presented a contracted appearance; bronchial lining membrane red; emphysema of anterior edge of right lung; right weighed 33, left, 22; heart, 12½ ounces.

Abdomen.—Old peritoneal adhesions; liver 59 ounces; spleen, ¾ ounce. All the other organs normal.

Case 181.—Aged 59 years.

Head.—Wasting of the convolutions; fluid beneath the arachnoid, and in the lateral ventricles considerable absorption of the left corpus striatum; no paralysis.

Chest.—Pleuritic adhesions of apex of left lung, which contained a small tuberculous cavity, lined by a membrane; induration of surrounding portion of lung; inflammation of the bronchial lining membrane; large air bullæ on edge of upper lobe of right lung; weight of right, 19 ounces, left, 32. Heart small, 6½ ounces.

Abdomen.—A tumour of the size of an almond attached to the posterior portion of the œsophagus, near its junction with the stomach; it contained a fluid like honey. All the organs normal.

Case 182.—Aged 60 years.

Head.—Brain normal.

Chest.—Redness of the bronchial lining membrane; extensive emphysema of both lungs; congestion of right, which weighed 37½ ounces; left, 24½ ounces.

Abdomen.—Liver weighed 52 ounces; spleen, 7 ounces. Other organs normal.

Case 183.—Aged 60 years.

Head.—Brain weighed 46½ ounces.

Chest.—Thickening of the bronchial lining membrane; lungs congested; weight, 75½ ounces. Heart enlarged; weight 13 ounces.

Abdomen.—Liver, 67 ounces; stomach, 7 ounces; kidneys, 13½ ounces.

Case 184.—Aged 60 years.

Head.—Brain normal.

Chest.—Intense redness and thickening of the bronchial lining membrane; general emphysema of lungs; some œdema of lower lobes; weight of lungs, 55½ ounces; heart, 11 ounces.

Abdomen.—Kidneys, 10½ ounces. The other organs normal.

Case 185.—Aged 63 years.

Head.—Brain 47½ ounces.

Chest.—Old and firm pleuritic adhesions on both sides, in some places almost cartilaginous; lungs condensed; air bullæ on the edge of upper lobe of right lung; thickening of the bronchial lining membrane.

Abdomen.—Stomach, 9 ounces; kidneys, 10 ounces. The other organs normal.

Case 186.—Aged 64 years.

Head.—Wasting of the convolutions of brain; some fluid beneath arachnoid; weight of brain 52 ounces.

Chest.—Old pleuritic adhesions on both sides; thickening of the bronchial lining membrane; congestion of the lower lobes; weight of lungs, 45 ounces. Heart greatly enlarged, weight, 19 ounces.

Abdomen.—Organs enlarged; liver, 65 ounces; spleen, 8 ounces; stomach, 5½ ounces; kidneys, 10½ ounces.

Case 187.—Aged 64 years. Employment, a scavenger; several years subject to cough. The distressing symptoms, orthopnoea, &c. came on five days before death.

Head.—Brain normal.

Chest.—No pleuritic adhesions; emphysema of both lungs; general thickening of bronchial lining membrane; tubes filled with muco-purulent secretion; congestion of lower lobe of right lung; weight, 19½ ounces, left, 17 ounces; heart, 11½ ounces.

Abdomen.—Kidneys enlarged; left weighed 6 ounces; right, 4 ounces. Other organs normal.

Case 188.—Aged 70 years. For three years subject to occasional attacks of dyspnoea.

Head.—Brain normal.

Chest.—Thickening of bronchial lining membrane; lungs congested; weight, 54½ ounces. Heart enlarged; weight, 15½ ounces.

Abdomen.—Liver, 57½ ounces; stomach, 6 ounces; pancreas, 4½ ounces; kidneys, 10½ ounces; hydrocele on right side.

Case 189.—Aged 71 years.

Head.—Brain normal.

Chest.—Old pleuritic adhesions; emphysema of lungs; congestion of lower lobes; bronchial lining membrane red; weight of lungs, 72½ ounces. Heart enlarged; weight, 12½ ounces.

Abdomen.—Organs normal.

Case 190.—Aged 71 years.

Head.—Brain firm; about two drachms of fluid in the lateral ventricles.

Chest.—Old pleuritic adhesions; thickening of the bronchial lining membrane; tubes filled with muco-purulent secretion; lungs weighed, 45 ounces. A few tubercles in apices of both lungs.

Abdomen.—Organs normal.

Case 191.—Aged 72 years.

Head.—Slight flattening of the convolution of the posterior lobe of the brain; some fluid in the lateral ventricles.

Chest.—On the pleura covering one of the lungs, an appearance like a cicatrix; no pleuritic adhesions; emphysema; redness and thickening of the bronchial lining membrane of both lungs; weight, 29 ounces. Heart enlarged; weight, 15 ounces.

Abdomen.—Liver, 51 ounces; stomach, 7½ ounces; pancreas, 4½ ounces; kidneys, 11½ ounces.

Case 192.—Aged 74 years.

Head.—Nearly one ounce of fluid in lateral ventricles.

Chest.—Redness and thickening of the bronchial lining membrane of both lungs; emphysema of upper lobes; lobes of both lungs greatly congested, particularly right; weight, 30¾ ounces; left, 18 ounces; heart, 13¾ ounces; osseous deposits in aorta.

Abdomen.—Omentum loaded with fat; organs enlarged; liver, 53 ounces; gall-bladder filled with calculi and purulent-looking matter; spleen, 12½ ounces; stomach, 7½ ounces; kidneys, 11 ounces.

Case 193.—Aged 79 years.

Head.—Brain normal.

Chest.—Old pleuritic adhesions; tubercular deposit in apex of right lung; general bronchitis; weight of lungs, 49 ounces.

Abdomen.—Liver small, 29½ ounces; kidneys much enlarged, contained several large cysts; weight of right, 10 ounces; left, 10½ ounces.

Case 194.—Aged 84 years.

Head.—Wasting of the convolutions of brain; some straw-coloured fluid beneath the arachnoid; weight, 41½ ounces.

Chest.—General emphysema of both lungs; thickening of the bronchial lining membrane; congestion of the lower lobe; right lung weighed 24 ounces; left, 16 ounces; heart, thickening of the valves; weight, 8 ounces; ossific deposits in the arteries.

Abdomen.—Large serous cysts in the upper part of both kidneys; spleen, capsule cartilaginous, one-quarter of an inch in thickness.

TABLE I.—BRONCHITIS, (FEMALES.)

Case 195.—Aged 6 months. General wasting of body ; vomiting on admission.

Head.—Brain firm.

Chest.—Bronchial tubes filled with muco-purulent matter ; congestion of lower lobes without induration ; weight of lungs $2\frac{1}{2}$ ounces.

Abdomen.—All the organs normal.

Case 196.—Aged 2 years.

Head.—Brain congested ; fluid in the ventricles ; weight, $39\frac{1}{4}$ ounces

Chest.—Redness of the bronchial lining membrane ; congestion of both lungs ; weight, $4\frac{1}{2}$ ounces.

Abdomen.—All the organs normal.

Case 197.—Aged 6 years.

Head.—Brain normal.

Chest.—Redness of the bronchial lining membrane ; lungs congested ; weight, 12 ounces.

Abdomen.—All the organs normal.

Case 198.—Aged 18 years. Great dyspnœa ; cough with abundant expectoration.

Head.—Brain normal.

Chest.—Old pleuritic adhesions ; redness of bronchial lining membrane ; congestion of lower lobe of right lung ; emphysema of upper lobes of both lungs ; weight of right, 19 ounces ; left, $16\frac{1}{2}$ ounces.

Abdomen.—All the organs normal.

Case 199.—Aged 39 years. Great dyspnœa ; an attack of bronchitis for twelve winters successively.

Head.—Brain healthy in structure ; large ; weight, $47\frac{1}{4}$ ounces.

Chest.—Thickening of bronchial lining membrane ; emphysema of both lungs ; weight 37 ounces ; heart, weight $10\frac{1}{4}$ ounces.

Abdomen.—Organs large ; liver, $52\frac{1}{2}$ ounces ; kidneys, $11\frac{1}{4}$ ounces ; spleen, $5\frac{1}{4}$ ounces ; stomach, 6 ounces.

Case 200.—Aged 44 years. Anasarca of the lower extremities.

Head.—Lateral ventricles contained $1\frac{1}{2}$ ounce of fluid.

Chest.—Contained a small quantity of fluid, more than natural ; thickening of the bronchial lining membrane ; emphysema of both lungs in upper lobes ; lower lobes in the first stage of pneumonia ; weight 58 ounces.

Heart.—Endocarditis ; heart itself enlarged and dilated ; weight, 14 ounces.

Abdomen.—Some fluid in the cavity of the abdomen ; kidneys, $11\frac{1}{2}$ ounces ; stomach, $6\frac{3}{4}$ ounces. Other organs normal.

Case 201.—Aged 45 years. Great dyspnœa and extreme prostration on admission ; cough for six winters.

Head.—Brain normal.

Chest.—Pleuritic adhesions on both sides ; lungs congested ; redness and thickening of the bronchial lining membrane ; muscular fibres enlarged ; weight of lungs, 44 ounces ; heart, 9 ounces.

Abdomen.—Slight congestion of the mucous membrane of the small intestines ; liver, $49\frac{1}{2}$ ounces ; stomach, $5\frac{1}{2}$ ounces ; kidneys, $9\frac{1}{4}$ ounces.

Case 202.—Aged 46 years.

Head.—Weight of brain, 48 ounces.

Chest.—Lungs emphysematous, bronchial tubes dilated ; lining membrane red and thickened, filled with muco-purulent secretion ; œdema of the upper lobe of right lung ; weight, 23 ounces ; left, $12\frac{1}{2}$ ounces ; about half-a pint of fluid in right pleura.

Abdomen.—Abdominal cavity contained a quantity of fluid. All the organs normal.

Case 203.—Aged 47 years. A sudden attack of dyspnoea four hours before death.

Head.—Brain weighed $45\frac{1}{2}$ ounces.

Chest.—Old pleuritic adhesions and earthy deposits in apices of both lungs; emphysema; thickening of bronchial lining membrane.

Abdomen.—A small fibrous tumour in the uterus. All the organs normal.

Case 204.—Aged 51 years. Suffering for some time from orthopnoea, with frothy expectoration.

Head.—Brain weighed $46\frac{1}{2}$ ounces.

Chest.—Slight pleuritic adhesions on both sides; emphysema, especially of the upper lobe; dilatation of the bronchial tubes, with redness and thickening of the lining membrane; congestion of the lower lobe of right lung, which weighed $13\frac{1}{2}$ ounces; left, $8\frac{1}{2}$ ounces.

Abdomen.—Congestion of the liver and kidneys; other organs normal.

Case 205.—Aged 53 years. Suffering from extreme debility on admission.

Head.—Brain normal.

Chest.—Emphysema of the upper lobes of both lungs; congestion of lower; thickening of bronchial lining membrane. Lungs weighed 28 ounces; heart, 11 ounces, cavities distended with coagulated blood.

Abdomen.—Liver weighed 35 ounces; kidneys wasted, weighed only $4\frac{1}{2}$ ounces; left, contained a cyst filled with fluid.

Case 206.—Aged 54 years. Complained only of debility.

Head.—Brain weighed $37\frac{1}{2}$ ounces.

Chest.—Dilatation of the bronchial tubes; thickening of the lining membranes; old pleuritic adhesions on right side; hepatization of the lower lobe of left lung; right lung, $6\frac{1}{2}$ ounces; left, 19 ounces; heart, 8 ounces.

Abdomen.—Wasting of the organs generally; liver, 29 ounces; spleen, 5 ounces; stomach, $3\frac{1}{2}$ ounces; left kidney, $\frac{1}{2}$ ounce; right, 3 ounces.

Case 207.—Aged 59. Great dyspnoea and lividity of countenance.

Head.—Brain normal.

Chest.—Slight pleuritic adhesions and emphysema of both lungs; bronchial lining membrane red and thickened, covered with muco-purulent secretions; weight of lungs, 31 ounces; heart, 10 ounces; no valvular disease.

Abdomen.—Liver, 50 ounces; kidneys, $9\frac{1}{2}$ ounces; spleen, 8 ounces. A number of small fibrous tumours on uterus.

Case 208.—Aged 59 years.

Head.—Brain normal.

Chest.—Lungs compressed from lateral curvature of spine; bronchial lining membrane red and thickened, covered with muco-purulent secretion; lungs weighed 30 ounces.

Abdomen.—Wasting of the organs. Liver, $29\frac{1}{2}$ ounces; kidneys, $7\frac{1}{2}$ ounces; stomach, $2\frac{1}{2}$ ounces.

Case 209.—Aged 60 years.

Head.—Ossific deposit at the point of junction of the *fals cerebri* with the *tentorium*; brain normal.

Chest.—Old pleuritic adhesions very strong, especially on right side; emphysema of both lungs, and redness and thickening of the bronchial lining membrane; congestion of lower lobe of right; lung weighed 18 ounces; left, 15 ounces; heart, $10\frac{1}{2}$ ounces.

Abdomen.—Liver, congestion of the portal system; weight, $49\frac{1}{2}$ ounces; softening of cortical portion of kidneys; weight, $9\frac{1}{2}$ ounces; some small fibrous tumours in uterus, weight, $2\frac{1}{2}$ ounces.

Case 210.—Aged 60 years.

Head.—Brain normal.

Chest.—General emphysema of both lungs, and thickening of the bron-

chial lining membrane; congestion of the lower lobe of right lung; weight, 12½ ounces; left, 10½ ounces.

Abdomen.—Organs normal.

Case 211.—Aged 62 years.

Head.—Opacity of the arachnoid; about 1½ ounce of clear fluid in the lateral ventricles of brain.

Chest.—Firm pleuritic adhesions on both sides; congestion of lower lobe of right lung; redness and thickening of bronchial lining membrane; right lung, 10½ ounces; left, 10 ounces. Ossific deposits in the arterial tubes.

Abdomen.—Organs normal.

Case 212.—Aged 62 years. Troubled with asthma for many years.

Head.—Brain normal.

Chest.—General emphysema of both lungs; redness and thickening of bronchial lining membrane; tubes nearly filled up with a tough secretion; weight of lungs, 30½ ounces. Heart, dilatation and thickening of right ventricle and of tricuspid valve; weight, 9 ounces.

Abdomen.—Organs normal.

Case 213.—Aged 63 years.

Head.—About 1 ounce of clear fluid in lateral ventricles of brain.

Chest.—Redness and thickening of bronchial lining membrane of both lungs; emphysema of upper lobes; slight congestion of inferior lobe of right, weight, 18 ounces; left 14 ounces.

Abdomen.—A fibrous tumour, size of a goose egg, in fundus of uterus.

Case 214.—Aged 64.

Head.—Brain normal.

Chest.—Redness and thickening of the bronchial lining membrane; congestion of lower lobe of right lung; weight, 15 ounces; left, 10½ ounces. Heart, 12 ounces.

Abdomen.—Organs normal.

Case 215.—Aged 64 years.

Head.—An increased quantity of fluid in the lateral ventricles of brain.

Chest.—Thickening of the bronchial lining membrane; tubes filled with muco-purulent secretion; weight of right lung, 17½ ounces; left, 11½ ounces. Heart enlarged; weight, 13 ounces.

Abdomen.—Organs normal.

Case 216.—Aged 65 years.

Head.—Opacity of the arachnoid, a quantity of fluid in lateral ventricles.

Chest.—Old pleuritic adhesions; thickening of bronchial lining membrane; tubes filled with muco-purulent secretion; emphysema of left lung chiefly; weight, 15½ ounces; right, 20 ounces; heart, 9½ ounces.

Abdomen.—Organs small. Liver, 31 ounces; spleen, 2½ ounces; stomach, 3½ ounces; kidneys, 5½ ounces. Small bony deposits in uterus.

Case 217.—Aged 66 years.

Head.—Brain normal.

Chest.—Old pleuritic adhesions of upper lobes of both lungs; redness of bronchial lining membrane; tubes filled with muco-purulent matter. Lungs congested, especially left; weight, 24 ounces; right, 22½ ounces. Heart, thickening of its walls; weight, 11½ ounces.

Abdomen.—A small serous cyst attached to left ovary. Liver, 52 ounces; stomach, 6½ ounces.

Case 218.—Aged 70 years. Cough of two years standing.

Head.—Weight of brain, 30½ ounces.

Chest.—Emphysema of both lungs; thickening of the bronchial lining membrane; weight of lungs, 30½ ounces; heart, 7½ ounces.

Abdomen.—Organs small. Liver, 28½ ounces; spleen, 2½ ounces; stomach, 5 ounces; kidneys, 7½ ounces.

Case 219.—Aged 70 years. Cough of twenty years standing.

Head.—Congestion of vessels of brain.

Chest.—Emphysema and thickening of the bronchial lining membrane of both lungs; weight, 22 ounces. Auricles of heart distended with blood; *foramen ovale* sufficiently open so as to permit a large catheter to pass; weight of heart, 11½ ounces.

Abdomen.—Congestion of the liver and kidneys, also of the mucous membrane of large intestines.

Case 220.—Aged 70 years. For a length of time subject to attacks of dyspnœa.

Head.—Brain normal.

Chest.—Redness and thickening of the bronchial lining membrane; muco-purulent secretion in tubes; congestion of lower lobes of right lung, weight, 30 ounces; left, 22½ ounces.

Abdomen.—Organs in a state of anæmia; two fatty tumours about the size of an orange, and several hydatid cysts attached to right ovary and broad ligament; uterus healthy.

Case 221.—Aged 71 years.

Head.—A considerable quantity of fluid in lateral ventricles. Brain congested; a cavity on posterior part of right hemisphere containing about one ounce of a clear fluid; structure of brain normal.

Chest.—Upper lobes of both lungs emphysematous; redness and thickening of bronchial lining membrane; tubes contained a muco-purulent secretion; weight of lungs, 24 ounces; heart, 3½ ounces.

Abdomen.—Organs small; liver, 33 ounces; spleen, 3 ounces; kidneys, 7 ounces.

Case 222.—Aged 71 years.

Head.—A considerable quantity of fluid in the lateral ventricle.

Chest.—Thickening of the bronchial lining membrane; tubes contained a quantity of muco-purulent secretion. Weight of lungs, 22¾ ounces.

Abdomen.—Organs normal.

Case 223.—Aged 71 years.

Head.—Brain normal.

Chest.—Emphysema of lungs, and thickening of bronchial lining membrane.

Abdomen.—Organ small.

Case 224.—Aged 72 years. Died suddenly, with symptoms of dyspnœa.

Head.—Brain normal.

Chest.—Old pleuritic adhesions on both sides, and partial emphysema of upper lobes; bronchial tubes loaded with muco-purulent secretion, thickening of their lining membrane; weight of lungs, 29 ounces.

Abdomen.—Organs normal.

Case 225.—Aged 73 years.

Head.—Brain much congested, particularly *cerebellum* and *Pons Varolii*.

Chest.—Old pleuritic adhesions; redness and thickness of the bronchial lining membrane; tubes contained a large quantity of muco-purulent secretion; weight of lungs, 28½ ounces; heart, 11 ounces.

Abdomen.—A small fibrous tumour attached to left ovary. Other organs normal.

Case 226.—Aged 73 years.

Head.—Wasting of the substance of the brain; nearly 2 ounces of fluid in the lateral ventricles.

Chest.—Emphysema of both lungs, a few tubercles dispersed through both; thickening of the bronchial lining membrane; weight of lungs, 30½ ounces. Heart small, weight, 6¾ ounces.

Abdomen.—Organs small; liver, 28¾ ounce; kidneys, 5¾ ounces.

Case 227.—Aged 74 years.

Head.—Brain congested, very firm; weight, 43¾ ounces.

Chest.—Emphysema of upper lobes; redness and thickening of bronchial lining membrane; congestion of lower lobe of right lung, weight, 21 ounces; left, 13 ounces; slight pleuritic adhesions on both sides.

Abdomen.—Liver, $52\frac{1}{2}$ ounces; several fibrous tumours attached to the outer surface of uterus.

Case 228.—Aged 74 years. Confined to bed for seven years from chronic rheumatism; fingers and toes contracted.

Head.—Wasting of brain; weight, 36 ounces; more fluid than natural in lateral ventricles.

Chest.—General thickening of the bronchial lining membrane; weight of lungs, 50 ounces. Heart small, 8 ounces.

Abdomen.—All the organs below the average, except stomach; liver, 37 ounces; stomach, 5 ounces; pancreas, $2\frac{1}{2}$ ounces; spleen, $3\frac{1}{4}$ ounces.

Case 229.—Aged 74 years.

Head.—Brain normal.

Chest.—No pleuritic adhesions; ossific deposit in the bronchial tubes; redness and thickening of the lining membrane; much muco-purulent secretion in bronchii; lungs dry and dark-coloured; weight, 30 ounces; heart, 10 ounces; ossific deposit in the arteries.

Abdomen.—Organs small; liver, 29 ounces; stomach, 4 ounces; kidneys, $6\frac{1}{2}$ ounces; spleen, 1 ounce.

Case 230.—Aged 74 years.

Head.—Brain, 47 ounces.

Chest.—Old pleuritic adhesions, redness and thickening of the bronchial lining membrane of both lungs; congestion of lower lobes; weight of right, 15 ounces; left 17 ounces. Heart, thickening of the valves, weight, $12\frac{1}{2}$ ounces.

Abdomen.—Organs normal.

Case 231.—Aged 77 years. Contraction of the lower extremities.

Head.—Dilatation of the lateral ventricles, containing about 3 ounces of a clear fluid.

Chest.—Slight emphysema of upper lobes of both lungs; some tubercles in the apices; thickening of the bronchial lining membrane; old pleuritic adhesions.

Abdomen.—Organs small; kidneys, $4\frac{3}{4}$ ounces.

Case 232.—Aged 77 years. Abscess on right shoulder, extending over greater part of scapula.

Head.—Dura mater adherent to the brain; weight $36\frac{1}{4}$ ounces.

Chest.—Emphysema of upper lobes of both lungs; thickening of the bronchial lining membrane; tubes contained a quantity of muco-purulent secretion; weight of heart, $7\frac{3}{4}$ ounces.

Abdomen.—Organs small; liver, $31\frac{1}{4}$ ounces; spleen, $1\frac{1}{2}$ ounce; stomach, 3 ounces.

Case 233.—Aged 78 years.

Head.—Brain congested.

Chest.—Old pleuritic adhesions; redness and thickening of bronchial lining membrane; structure of lower lobes of right lung condensed; weight, 18 ounces; left, 14 ounces; weight of heart, 11 ounces.

Abdomen.—Left kidney one ounce heavier than right; other organs normal; old inguinal hernia on right side; intestine in sac congested.

Case 234.—Aged 80 years. In a state of torpor several days before death.

Head.—Opacity of arachnoid, some fluid beneath it; softening of right hemisphere; weight of brain, $38\frac{1}{2}$ ounces.

Chest.—Redness and thickening of the bronchial lining membrane; con-

gestion of the lower lobes of both lungs ; structure less firm than usual ; general emphysema ; weight of lungs, $31\frac{1}{2}$ ounces.

Abdomen.—Liver $28\frac{1}{2}$ ounces ; spleen, $1\frac{1}{2}$ ounce ; structure of both soft ; pelvis of kidney contained a dark-brown fluid.

Case 235.—Aged 80 years.

Head.—Brain normal.

Chest.—Redness and thickening of the bronchial lining membrane ; weight of lungs, 37 ounces. Heart small, 7 ounces.

Abdomen.—All the organs below average, except the liver, weight, 47 ounces ; kidneys, $6\frac{1}{2}$ ounces ; pancreas, $1\frac{1}{2}$ ounce ; stomach, 3 ounces ; spleen, 2 ounces.

Case 236.—Aged 82 years.

Head.—Lateral ventricle contained about 1 ounce of clear fluid.

Chest.—Pleuritic adhesion of upper lobes of lungs ; earthy deposits in their apices ; general emphysema ; redness and thickening of the bronchial lining membrane ; tubes loaded with muco-purulent secretion, some ossific deposits in their coats ; induration of lower lobe of right lung, weight, $15\frac{1}{2}$ ounces ; left, 11 ounces ; heart, $11\frac{1}{2}$ ounces.

Abdomen.—Organs small ; liver, $30\frac{1}{2}$ ounces ; stomach, 4 ounces ; pancreas, $2\frac{1}{2}$ ounces ; kidneys, $5\frac{1}{2}$ ounces.

Case 237.—Aged 82 years.

Head.—Brain congested.

Chest.—Emphysema of lower lobes of both lungs ; œdema of upper lobes ; bronchial lining membrane congested and thickened ; tubes contained a quantity of muco-purulent secretion ; weight of lungs, $44\frac{1}{2}$ ounces ; heart, 12 ounces.

Abdomen.—Organs normal.

Case 238.—Aged 83 years.

Head.—Brain $39\frac{1}{2}$ ounces.

Chest.—Emphysema of both lungs ; thickening of bronchial lining membrane ; weight of lungs, $26\frac{1}{2}$ ounces ; heart small ; deposit of lymph of the size of a pin's head, on edges of tricuspid valves, which were easily torn. Heart soft and flabby, weight, $8\frac{1}{2}$ ounces.

Abdomen.—Liver soft, surface of right lobe adherent to the diaphragm, weight, 49 ounces.

Case 239.—Aged 84 years.

Head.—Skull unusually thick posteriorly ; brain normal.

Chest.—Emphysema of lungs ; thickening of bronchial lining membrane ; tubes loaded with muco-purulent secretion ; congestion of lower lobes ; weight of right lung, $21\frac{1}{2}$ ounces ; left, 16 ounces ; heart enlarged, weight $13\frac{1}{2}$ ounces.

Abdomen.—An ovarian cyst on right side of the size of an orange ; liver, 39 ounces ; stomach, 6 ounces ; kidneys, $6\frac{1}{2}$ ounces.

Case 240.—Aged 85 years.

Head.—Brain normal.

Chest.—No pleuritic adhesions ; thickening of the lining membrane of the bronchial tubes, which contained a quantity of muco-purulent secretion ; some ossific deposits in the bronchii ; pulmonary apoplexy in the upper and back part of right lung ; œdema of lower lobes, weight 23 ounces ; left, 15 ounces ; heart, 12 ounces.

Case 241.—Aged 90 years. Slight cough ; symptoms more those of natural decay from age ; blind for years.

Head.—Brain small, weight, $35\frac{1}{2}$ ounces ; optic nerves smaller, flatter, and of a darker colour than usual.

Chest.—Left side contracted, and old pleuritic adhesions ; emphysema of right lung ; muco-purulent secretion in bronchial tubes, and their lin-

ing membranes red and thickened; right lung weighed $14\frac{1}{2}$ ounces; left, $10\frac{1}{2}$ ounces; heart weighed 9 ounces.

Abdomen.—Organs wasted; liver, $25\frac{1}{2}$ ounces; stomach, $3\frac{1}{2}$ ounces; pancreas, $1\frac{1}{2}$ ounce; spleen, $1\frac{1}{2}$ ounce; kidneys, $5\frac{1}{2}$.

Of the seventy-three cases of bronchitis, twenty-six were males, two of the cases have not been included in the table, and forty-seven females. The second case in the table, among the males, was that of a child, in which congestion of the brain and emphysema of the lungs were combined with bronchitis. In four other cases there was also congestion of the brain, and in each of these the heart was enlarged. There was an increased quantity of fluid in the brain in six cases, with more or less wasting of its substance. The brain was above the average weight in eight cases, and below it in two.

Traces of old pulmonary disease were found, in most cases, consisting of pleuritic adhesion of long standing; emphysema in sixteen cases; tuberculous or earthy deposit in six cases. The lungs were above the average weight in thirteen cases, owing to congestion or incipient pneumonia; and below it in nine cases.

The heart was above the average weight in sixteen cases, and below in two.

The abdominal organs were generally or partially enlarged in sixteen cases; the heart in these instances, with two exceptions, was also enlarged. In sixteen cases the average time in the Infirmary was $16\frac{3}{4}$ days.

Among the forty-seven females, there was congestion of the brain in seven instances, and opacity of the arachnoid, and serous effusions in a greater or less degree in thirteen cases; bony deposit in *dura mater* in one; wasting of optic nerves, one. The brain was above the average weight in five cases, and below it in eight.

Old pleuritic adhesions were frequently found. Emphysema existed in twenty-five cases, and congestion or incipient pneumonia in nineteen cases; pulmonary apoplexy in one case, and tubercles in two. The lungs were above the average weight in nine cases, and below it in twenty-four.

The heart was above average weight in twenty cases, and below it in five. The *fossa ovalis* partially closed in one case, valvular disease in two, and endocarditis in one case. The abdominal organs were below the average weight in fifteen cases, in only two was the liver above it; the stomach was above it in three cases. Abnormal state of the uterus and ovaries in five cases, and in one case inguinal hernia. The greater number of the above cases occurred in subjects of advanced age, several of them being invalids for years in the chronic wards of the work-house, and generally were cut off rather suddenly with distressing fits of orthopnoea.

In twenty-six cases the average time in the Infirmary was $11\frac{1}{2}$ days.

TABLE II.—PNEUMONIA, (MALES.)

Case 242.—Aged 2 weeks. Body greatly emaciated.

Head.—Brain normal.

Chest.—Lower lobe of right lung in first stage of hepatization ; weight of lung $1\frac{1}{4}$ ounce ; left 1 ounce.

Abdomen.—Organs normal.

Case 243.—Aged 3 weeks. Died convulsed.

Head.—Brain congested.

Chest.—Lobular pneumonia in lower lobe of both lungs ; weight of lungs equal, $1\frac{1}{4}$ ounce.

Abdomen.—Organs normal.

Case 244.—Aged 6 weeks. Body covered with a syphilitic eruption ; greatly emaciated.

Head.—Brain normal.

Chest.—Lobular pneumonia of lower lobe of right lung, weight $1\frac{1}{4}$ ounce. Left had a granular feel ; on dividing it a number of granules were observed ; hard in centre, and surrounded by purulent matter ; weight of lung $\frac{3}{4}$ ounce.

Abdomen.—Mesenteric glands enlarged.

Case 245.—Aged 2 months. Affected with pertussis for some time previous ; body exsanguineous.

Head.—Brain in a state of anæmia ; difference betwixt cortical and medullary portions indistinct.

Chest.—The lower portion of upper lobes of both lungs in a state of gray hepatization, and a part of each of about the size of a pigeon's egg, in a state of purulent infiltration. A quantity of recently effused lymph effused on the pleura ; the diseased parts greatest on the right lung ; weight of right, $2\frac{1}{4}$ ounces ; left, $2\frac{1}{4}$ ounces.

Abdomen.—All the viscera in a state of anæmia.

Case 246.—Aged 10 weeks. Delicate from birth ; great wasting ; weight of body only 6 lbs.

Head.—Unusually oval-shaped ; a separate ossific centre in the anterior fontanelle.

Chest.—Lobular pneumonia of the lower lobe of right lung ; weight, $1\frac{1}{4}$ ounce ; congestion of lower lobe of left ; weight, $1\frac{1}{4}$ ounce.

Abdomen.—All the organs below the average size.

Case 247.—Aged 3 months. Died convulsed ; mother had syphilis ; when child was born, it was covered with an eruption which was now nearly gone.

Head.—Brain normal.

Chest.—Lobular pneumonia affecting the lower lobe of left lung, weight, $1\frac{1}{4}$ ounce ; right lung, 1 ounce.

Abdomen.—Liver congested ; mesenteric glands enlarged.

Case 348.—Aged 4 months. Pneumonia subsequent to rubeola.

Head.—Brain normal.

Chest.—Lobular pneumonia of lower lobes of both lungs ; a quantity of purulent matter in bronchial tubes ; at the base of right lung was a small cyst containing cheesy matter ; a few small masses of tubercular matter were found scattered through both lungs ; right weighed $2\frac{1}{4}$ ounces ; left, $1\frac{1}{4}$ ounce.

Abdomen.—Enlargement of mesenteric glands.

Case 249.—Aged 6 months.

Head.—Brain normal.

Chest.—Hepatization of lower lobe of left lung ; congestion of the posterior portion of right ; weight of lungs, $3\frac{1}{2}$ ounces.

Abdomen.—Great enlargement of mesenteric glands.

Case 250.—Aged 6 months. Diarrhœa for several weeks previous to death ; sloughing of surface of chest from a blister which had remained on only three hours.

Head.—Brain normal.

Chest.—Redness ; induration of lower lobes of left lung ; weight, $2\frac{1}{4}$; right, $1\frac{1}{2}$ ounces.

Abdomen.—Great enlargement of mesenteric glands

Case 251.—Aged 7 months. Body in a state of anæmia.

Head.—Brain normal.

Chest.—Incipient pneumonia effecting lower lobes of both lungs ; apices of both lungs pale and emphysematous ; weight of lungs, $6\frac{1}{4}$ ounces.

Abdomen.—Organs natural.

Case 252.—Aged 7 months. Slight cough was only observed three days before death.

Head.—Brain congested.

Chest.—Lower lobes of both lungs hepatized ; structure of both lungs readily broken down ; bronchial lining membrane red ; tubes contained muco-purulent matter ; weight of right lung, 4 ounces ; left, $3\frac{1}{4}$ ounces.

Abdomen.—Organs natural.

Case 253.—Aged 7 months.

Head.—Brain normal.

Chest.—Extensive lobular pneumonia of lower lobes of both lungs, most in left ; redness of bronchial lining membrane ; tubes filled with muco-purulent matter ; right lung weighed 4 ounces ; left, 6 ounces.

Abdomen.—Organs normal.

Case 254.—Aged 7 months. Had two paroxysms of convulsions some days before death.

Head.—Congestion of brain. When cut into, numerous bloody points were observed ; weight of brain, $27\frac{3}{4}$ ounces.

Chest.—Lobular pneumonia of lower lobes of both lungs ; their edges had a granular feel when divided ; thin pus escaped from a number of small cavities containing a central depression ; emphysema of upper lobe of both lungs ; right weighed $2\frac{3}{4}$ ounces ; left, $2\frac{1}{2}$ ounces.

Abdomen.—Several ecchymosed specks on the mucous membrane lining large intestines.

Case 255.—Aged 8 months. Considerable emaciation ; diarrhœa some weeks previous to death.

Head.—Brain normal.

Chest.—Congestion of lower lobes of both lungs ; some hepatization of right ; weight, $1\frac{1}{2}$ ounce ; left, $1\frac{1}{4}$ ounce.

Abdomen.—Organs normal.

Case 256.—Aged 9 months. Pneumonia combined with measles.

Head.—Brain normal.

Chest.—Slight pleuritic adhesions ; lower lobe left lung ; a portion of the lobe in first stage of hepatization, with congestion of the surrounding parts ; lower lobe right lung in an advanced stage of pneumonia ; purulent matter in right bronchial tube ; a few tubercles in both lungs ; weight of lungs together, $7\frac{1}{4}$ ounces.

Abdomen.—Slight peritoneal adhesions of left lobe of liver ; mesenteric glands somewhat enlarged.

Case 257.—Aged 11 months.

Head.—Brain soft ; more fluid than natural in the lateral ventricles.

Chest.—Lower lobe of right lung in a state of hepatization, of the lobular form ; thin portion of middle lobe had a granular feel, when cut into and squeezed a grey matter exuded not unlike softened tubercle ; congestion of a portion of lower lobe of left : upper lobes of both emphysematous ; weight of right, 5 ounces ; left, $2\frac{1}{2}$ ounces.

Abdomen.—Liver large and fatty ; weight, 14 ounces.

Case 258.—Aged 1 year.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in a state of purulent infiltration, pu-

purulent matter exuding on slight pressure ; in one lung an abscess of the size of a hazel-nut lined by a membrane ; redness of the bronchial lining membrane ; tube contained some muco-purulent fluid ; no tubercles were observed ; right lung weighed $2\frac{3}{4}$ ounces ; left, $2\frac{1}{2}$ ounces.

Abdomen.—Pancreas of a redder colour than natural.

Case 259.—Aged 1 year. Pneumonia combined with *rubeola maligna*.

Head.—Congestion of brain.

Chest.—Lower lobes and posterior portion of both lungs in first stage of hepatization ; a small quantity of muco-purulent matter in bronchial tubes ; lungs together weighed $8\frac{3}{4}$ ounces.

Abdomen.—A pale circular patch size of half-a-crown on the convex surface of liver.

Case 260.—Aged 14 months.

Head.—Lateral ventricles dilated, containing about three drachms of clear fluid.

Chest.—Both lungs presented appearance of disease of some standing ; anterior thin edges of both firm and granular ; purulent matter could be pressed from granules ; right lung weighed 4 ounces ; left, $4\frac{1}{4}$ ounces.

Abdomen.—Organs pale.

Case 261.—Aged 14 months. Admitted with pertussis ; excessive heat of scalp during last days of illness.

Head.—Slight congestion of brain.

Chest.—Gray hepatization, with softening in lower lobe of right lung ; muco-purulent matter could be squeezed from bronchial tubes ; congestion of the lower lobe of left, which weighed $3\frac{1}{2}$ ounces ; right, 4 ounces.

Abdomen.—Organs normal.

Case 262.—Aged 14 months. Eleven weeks discharged from small-pox hospital.

Head.—Congestion of brain.

Chest.—Lower lobes of both lungs in the first stage of lobular pneumonia ; left most extensively affected ; bronchial lining membrane red ; right weighed 4 ounces ; left, $4\frac{1}{4}$ ounces.

Abdomen.—Organs normal.

Case 263.—Aged 14 months. Had pertussis and diarrhœa.

Head.—Brain unusually firm ; when divided, presented a number of bloody points.

Chest.—Whole of the lower lobe of right lung in a state of gray hepatization ; the lower part of right in a similar state ; lower lobe congested ; right lung weighed $3\frac{3}{4}$ ounces ; left, $2\frac{1}{2}$ ounces.

Abdomen.—Organs normal.

Case 264.—Aged 15 months. Œdema of face and upper and lower extremities ; little urine passed for some days before death.

Head.—Brain in a state of anæmia.

Chest.—Lobular pneumonia in the stage of purulent infiltration of both lungs ; weight of lungs, 5 ounces.

Abdomen.—Liver and kidney very pale ; other organs normal.

Case 265.—Aged 16 months. Child died suddenly during an attack of convulsions.

Head.—Slight congestion of brain.

Chest.—Lower lobes of both lungs in the first stage of hepatization ; disease most advanced in right ; a greater quantity of fluid than natural in the pericardium.

Abdomen.—Organs natural.

Case 266.—Aged 17 months. Admitted with pertussis and diarrhœa.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the second stage of hepatization most extensive in left ; right lung weighed $5\frac{3}{4}$ ounces ; left, 6 ounces.

Abdomen.—Left kidney situated partly in the pelvis ; its artery given off close to the inferior mesenteric ; right weighed $1\frac{3}{4}$ ounce ; left, 1 ounce ; lumbrici in jejunum and ileum.

Case 267.—Aged 18 months.

Head.—Brain firm.

Chest.—Lower lobes of both lungs hepatized ; structure firm ; upper lobes slightly emphysematous ; right weighed $3\frac{1}{2}$ ounces ; left, $3\frac{1}{4}$ ounces.

Abdomen.—Mesenteric glands enlarged.

Case 268.—Aged 18 months. Great emaciation ; obstinate diarrhoea for some time before death.

Head.—Brain normal.

Chest.—Nearly the whole of the left lung in the third stage of hepatization ; when divided, a quantity of matter escaped apparently from each lobe separately ; no tubercles observed ; right weighed $3\frac{1}{2}$ ounces ; left, $6\frac{1}{2}$ ounces.

Abdomen.—Tumid ; mesenteric glands greatly enlarged.

Case 269.—Aged $2\frac{1}{2}$ years. Admitted for diarrhoea ; great emaciation.

Head.—Brain normal.

Chest.—Induration of the lower lobe of the right lung : left had a granular feel ; nearly the whole of it diseased ; partly in second and partly in third stage of hepatization ; right weighed $5\frac{1}{2}$ ounces ; left, $5\frac{1}{2}$ ounces ; effusion into the pericardium ; some opacity and thickening of the endocardium.

Abdomen.—Organs normal.

Case 270.—Aged $2\frac{1}{2}$ years. Pneumonia, combined with *rubeola maligna* ; seven days under treatment.

Head.—Brain normal.

Chest.—Lobular pneumonia in an advanced stage in lower lobe of right lung ; lower lobe of left lung in first stage hepatization ; right lung weighed $6\frac{1}{2}$ ounces ; left, 7 ounces. Heart ; right auricle distended with fibrin.

Abdomen.—Organs normal.

Case 271.—Aged 3 years. Admitted for pertussis.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the first stage of hepatization ; emphysema of upper lobes, and redness of the bronchial lining membrane.

Abdomen.—Mesenteric glands enlarged.

Case 272.—Aged 4 years

Head.—Brain congested, large ; weighed $44\frac{1}{2}$ ounces.

Chest.—Lower lobes of both lungs, and posterior portion of upper of right in the first stage of hepatization ; weight of right, $6\frac{1}{2}$ ounces ; left, 5 ounces.

Abdomen.—Organs normal.

Case 273.—Aged 6 years.

Head.—Brain congested ; more fluid than natural in the lateral ventricles.

Chest.—Lobular pneumonia of both lungs ; most severe in right ; redness of bronchial lining membrane ; right weighed $8\frac{1}{2}$ ounces ; left, $6\frac{1}{2}$ ounces.

Abdomen.—Organs normal.

Case 274.—Aged 6 years. Gradual wasting, but little cough ; general symptoms of phthisis.

Head.—Brain normal.

Chest.—Lower lobe of right lung in second stage of hepatization ; pleura covering it coated with recently effused lymph ; also that covering diaphragm on right side ; right lung, 10 ounces ; left, $3\frac{1}{2}$ ounces.

Abdomen.—Congestion of mucous membrane of cæcum and colon.

Case 275.—Aged 7 years.

Head.—Brain normal.

Chest.—Lobular pneumonia of the anterior thin portion of both lungs ;

having a granular feel when divided ; granules found filled with pus ; upper lobes of both lungs emphysematous ; right weighed $16\frac{1}{2}$, left, $15\frac{1}{2}$ ounces.

Abdomen.—Two hydatid cysts on the liver of the size of hen's eggs, of a white colour externally ; one was situated on the edge of right lobe, the other near its middle ; when opened, found to contain an inner cyst filled with clear fluid.

Case 276.—Aged 12 years. In a state of collapse on admission ; complained only of pain in the loins.

Head.—Congestion of brain ; ventricles almost closed ; contained no fluid ; weight, $49\frac{1}{2}$ ounces.

Chest.—Lower lobes of both lungs congested ; portions varying from the size of a hazel-nut to a walnut, in a state of pulmonary apoplexy ; the pleura covering lower lobes coated with lymph ; a calcareous deposit in upper portion of left ; right weighed 14 ounces ; left, $11\frac{1}{2}$ ounces.

Abdomen.—Liver large and pale ; weight, 31 ounces.

Case 277.—Aged 23 years. Dulness on percussion of the whole of the left side.

Head.—Brain normal.

Chest.—Left pleural cavity contained a quantity of straw-coloured fluid ; pleuræ covered with recently exuded lymph ; the entire lung in the second stage of hepatization ; a small tuberculous cavity in its apex, the walls of which were covered with lymph similar to that covering the pleuræ ; lobular pneumonia of right lung ; a portion of the lower lobe of the size of an orange, in the second stage of hepatization ; in the upper lobe two portions of the same size in the first stage ; right lung weighed 30 ounces ; left, 58.

Abdomen.—Kidneys above the standard weight, 12 ounces ; coats of the intestines appeared thinner than natural.

Case 278.—Aged 29 years. Died seven hours after an attack of convulsions.

Head.—Brain normal.

Chest.—Hepatization of the whole of the left lung, except its apex, partly in the second and partly in the third stage of pneumonia ; pleuræ covered with recently effused lymph ; bronchial lining membrane red ; congestion of the lower lobe of left lung ; emphysema of its upper ; weight of right lung, 32 ounces ; left, $51\frac{1}{2}$ ounces ; pericardium distended with a clear fluid ; heart weighed 11 ounces.

Abdomen.—Liver weighed $62\frac{1}{2}$ ounces ; some lumbrici in the ilium, and congestion of its mucous membrane.

Case 279.—Aged 32 years. Cough of three months standing ; complete dulness on right side ; admitted with typhoid fever.

Head.—Brain large ; weight, $55\frac{1}{2}$ ounces.

Chest.—Recent pleuritic adhesions on right side ; lung in the third stage of hepatization ; weight, 73 ounces ; left, 24 ounces ; pericardium nearly filled, a clear fluid ; heart enlarged, weight, 15 ounces.

Abdomen.—All the organs enlarged ; right lobe congested ; left in contact with the spleen ; liver, 101 ounces ; spleen, 10 ounces ; stomach, 8 ounces ; pancreas, 6 ounces ; kidneys 13 ounces.

Case 280.—Aged 45 years.

Head.—Brain normal.

Chest.—Posterior portion of right lung hepatized ; œdema of left ; numerous cysts in both lungs, varying in size from a mustard seed to that of a bean, filled with inspissated mucus, surrounding lung, soft ; bronchial lining membrane red ; bronchial glands enlarged ; right lung 52 ounces ; left, 43 ounces ; surfaces of the pericardium closely united by old adhesions.

Abdomen.—Liver large ; weight, $63\frac{1}{2}$ ounces ; kidneys congested ; weight, 12 ounces.

Case 281.—Aged 46 years.

Head.—Brain normal.

Chest.—Nearly the entire of left lung in the third stage of pneumonia, a small tuberculous cavity lined with membrane in its apex; pleuræ covering this portion thickened and adherent to parietes; right lung emphysematous; a small quantity of earthy deposit in apex; bronchial lining membrane red and thickened; right lung weighed 22 ounces; left, 64½ ounces; cavities of heart dilated, weight, 11 ounces.

Abdomen.—Liver large; weight, 54½ ounces; kidneys, 10 ounces; stomach, 7½ ounces.

Case 282.—Aged 53 years.

Head.—Opacity of arachnoid surface of the brain covered with serum; organ pale; weight, 51½ ounces.

Chest.—The surface of the lower lobes of both lungs coated with lymph; both were in the second stage of hepatization, most extensive in left; weight 40½ ounces; right, 30 ounces. Heart enlarged, weight, 14½ ounces.

Abdomen.—Liver enlarged, weight, 78½ ounces; spleen soft.

Case 283.—Aged 55 years. Curvature of spine backwards; subject to diarrhoea.

Head.—More than usual quantity of fluid in the lateral ventricles.

Chest.—Lower lobe of right lung indurated and hepatized; weight, 17½ ounces; left 9½ ounces; heart, 11½ ounces.

Abdomen.—Liver large, weight, 56 ounces; kidneys, 13 ounces.

Case 284.—Aged 60 years.

Head.—Congestion of brain.

Chest.—Old pleuritic adhesions on left side; bony deposit in pleura on left side; 3 or 4 inches long, 2 broad; easily detached from the ribs; upper lobe of left lung in the third stage of pneumonia; thickening of the bronchial lining membrane of both lungs; right lung weighed 17 ounces; left, 39½ heart, 11 ounces.

Abdomen.—Lower half of right kidney occupied by a cyst containing cheesy-looking matter; spleen, 6 ounces; capsule thickened.

Case 285.—Aged 60 years.

Head.—Thickening of the arachnoid membrane; effusion of serum beneath and between the convolutions.

Chest.—Right lung in the third stage of hepatization; lower lobe of left in first stage; ulceration of the mucous membrane at root of the tongue, also of the larynx; cartilage of a dark colour; weight of right, 36 ounces; left, 28½ ounces; heart, 11½ ounces.

Abdomen.—Right kidney enlarged; weight, 5½ ounces; left, wasted; weight, 2 ounces; left renal capsule had a small tumour of the size of a marble, similar in structure to the organ itself.

Case 286.—Aged 60 years.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in an advanced stage of pneumonia; structure soft; emphysema of upper lobes; bronchial lining membrane red; weight of lungs together, 55½ ounces; heart weighed 11 ounces.

Abdomen.—Liver mottled, weight, 44½ ounces; kidneys, 10½ ounces; spleen, surface pale, weight, 5 ounces; scrotal hernia on right side.

Case 287.—Aged 62 years. No complaint made till the day before death.

Head.—Brain normal.

Chest.—Lower lobe of right lung in the third stage of hepatization; congestion of lower portion of upper lobe; bronchial lining membrane red and thickened; right lung weighed 33½ ounces; left, 14 ounces; heart, 11½ ounces.

Abdomen.—Most of the organs small; spleen, 2 ounces; kidneys, 6 ounces.

Case 288.—Aged 63 years. Diseased hip-joint; left thigh three inches shorter than right. A fistulous opening in left groin.

Head.—Brain weighed 53 ounces.

Chest.—Lower lobe of right lung in second stage of hepatization; some lymph effused on the surface covering it; firm adhesions on left side; some bony deposits in pleura; bronchial lining membrane red and thickened; right lung weighed 28 ounces; left, 16½ ounces; heart, 10½ ounces.

Abdomen.—Old adhesions betwixt convex surface of liver and the diaphragm; liver enlarged and congested, weight, 65½ ounces; left iliac fossa occupied partly by a quantity of fat containing bony deposits.

Case 289.—Aged 65 years.

Head.—About two ounces of clear fluid in the lateral ventricles.

Chest.—Effusion of fluid in the left pleural cavity; congestion and softening of lower lobes of both lungs; bronchial lining membrane of both red and thickened; right lung weighed 32 ounces; left, 34 ounces; heart, 11½ ounces.

Abdomen.—Organs normal.

Case 290.—Aged 65 years. Found destitute by the police.

Head.—From 2 to 3 ounces of clear fluid in the lateral ventricles of brain.

Chest.—Upper lobe of left lung in the state of grey hepatization; congestion of lower lobe of right lung, weight, 25½ ounces; left, 40; bronchial lining membrane thickened; surface of the pericardium adherent.

Abdomen.—Stomach large, pyloric extremity extending as low as the umbilicus; weight, 8½ ounces; liver, 52½ ounces; kidneys slightly granular, wasted; difference between cortical and tubercular portion scarcely perceptible; weight, 6½ ounces.

Case 291.—Aged 67 years. Hemiplegia of left side for a number of years.

Head.—A cellular cyst with rusty-coloured walls about the size of a horse bean, crossing the white fibre, in right *corpus striatum*. Brain pale and softer than natural.

Chest.—Lower lobe and posterior portion of right lung hepatized; redness and thickening of the bronchial lining membrane of both lungs; right weighed 27½ ounces; left, 15½ ounces; recent effusion of lymph on left side; heart, 12½ ounces.

Abdomen.—Liver small and soft; weight, 37 ounces; kidneys small, weight, 4½ ounces; a cyst in right, size of a walnut, containing fluid; stomach, 6 ounces.

Case 292.—Aged 70 years.

Head.—Brain pale and softer than natural.

Chest.—The whole of the left lung diseased, a part in three different stages of pneumonia; congestion of lower lobe of right lung; weight 27½ ounces; left, 40½ ounces; heart, 12½ ounces.

Abdomen.—Liver weighed 54 ounces; stomach, 6 ounces.

Case 293.—Aged 72 years.

Head.—Brain normal.

Chest.—Lower portion of the right lung in the third stage of pneumonia; left free from disease; weight of lungs, 53 ounces; heart, 11½ ounces.

Abdomen.—Organs normal.

Case 294.—Aged 74 years. Seized with vertigo in street, brought in by the police in a state of collapse, from which he never recovered.

Head.—Opacity of arachnoid; lateral ventricles dilated, and contained about three ounces of clear fluid.

Chest.—Recent pleuritic adhesions on left side; upper lobe of right lung in second stage of pneumonia: congestion of lower lobe, and about half its

surface covered with recent lymph; right lung, $41\frac{1}{2}$ ounces; left, $14\frac{1}{2}$ ounces; heart 10 ounces.

Abdomen.—Organs normal.

Case 295.—Aged 75 years.

Head.—Some small cysts filled with yellow matter attached to choroid plexus.

Chest.—Old pleuritic adhesions and earthy deposits on apices of both lungs; emphysema of upper lobes; sanguineous engorgement of lower lobes of both lungs, and softening of structure; right lung weighed $29\frac{1}{4}$ ounces; left, 26 ounces; heart, 18 ounces.

Abdomen.—Liver enlarged, weighed $55\frac{3}{4}$ ounces; left renal capsule, one-third larger than right.

Case 296.—Aged 76 years. Subject to fits.

Head.—Congestion of brain, and slight effusion of serum into the lateral ventricles.

Chest.—Right lung in third stage of pneumonia: weight, $44\frac{3}{4}$ ounces; left, 15 ounces. Heart enlarged; weight, $15\frac{1}{2}$ ounces.

Abdomen.—Liver, $56\frac{1}{2}$ ounces; kidneys, $11\frac{1}{2}$ ounces. Thickening of sub-mucous coat of pylorus.

Case 297.—Aged 77 years.

Head.—Brain weighed $49\frac{3}{4}$ ounces.

Chest.—Lower lobe of left lung in the third stage of pneumonia, some recent lymph effused on its surface; congestion of posterior portion of upper lobe; right lung infiltrated with yellowish-coloured serum; structure soft; right lung weighed 34 ounces; left, $39\frac{1}{2}$ ounces; heart, $11\frac{1}{2}$ ounces.

Abdomen.—Kidneys small; weight, 6 ounces; spleen soft.

Case 298.—Aged 78 years.

Head.—Wasting of the convolutions of the brain; weight, 39 ounces.

Chest.—Old and firm pleuritic adhesions on left side; anterior thin edge of upper lobe contained a number of hardened tubercles; induration of lower lobe; right lung weighed $39\frac{1}{2}$ ounces.

Abdomen.—Organs normal.

Case 299.—Aged 78 years.

Head.—Brain normal.

Chest.—Lower lobe in right lung in the third stage of pneumonia; lower lobe of left in second; left weighed $24\frac{3}{4}$ ounces; right, $27\frac{1}{2}$ ounces.

Abdomen.—Cysts filled with straw-coloured fluid in both kidneys; right weighed $4\frac{3}{4}$ ounces; left, 17 ounces.

Case 300.—Aged 78 years.

Head.—Brain weighed 49 ounces.

Chest.—Lower lobe of left lung and posterior of upper in second stage of pneumonia; congestion of lower lobe of right; weight of lungs, $71\frac{3}{4}$ ounces; heart, 9 ounces.

Abdomen.—Organs small; liver, $31\frac{3}{4}$ ounces; spleen, 2 ounces; stomach, $2\frac{1}{2}$ ounces; pancreas, $1\frac{1}{2}$ ounce.

Case 301.—Aged 80 years. Seized suddenly with syncope, and died in a few minutes. Asthmatic for several years.

Head.—About half an ounce of clear fluid in the lateral ventricles.

Chest.—Old pleuritic adhesions on left side; lower lobe of left hepatized; congestion of lower lobe of right; some earthy deposits in its apex; bronchial tubes dilated; thickening of their lining membrane; right lung weighed $28\frac{1}{2}$ ounces; left, 35 ounces. Heart enlarged; cavities distended with fibrin; weight, $17\frac{1}{2}$ ounces.

Abdomen.—Liver enlarged; weight, 71 ounces; stomach, 6 ounces; small serous cysts in kidneys; weight $10\frac{1}{2}$ ounces.

Case 302.—Aged 80 years.

Head.—Congestion of the brain.

Chest.—Pleuritic adhesions on both sides; nearly a pint of fluid in left

Lymph effused on lower lobes of both lungs; lower lobe of left in second stage of pneumonia; redness and thickening of the bronchial lining membrane; right weighed 25 ounces; left, 43½ ounces; heart, 14.

Abdomen.—Liver large; weight, 66 ounces; kidneys, 9½ ounces; stomach, 7½ ounces; spleen, 7½ ounces.

Case 303.—Aged 83 years.

Head.—Brain weighed 49½ ounces.

Chest.—A large cavity in apex of right lung filled with purulent matter mixed with blood; induration of the surrounding lung; no tubercles detected; redness and thickening of the bronchial lining membrane of both lungs; right weighed 29½ ounces; left, 16 ounces; heart, 10½ ounces.

Abdomen.—Organs small; liver, 38½ ounces; kidneys, 6½ ounces. Left renal capsule diseased.

Case 304.—Aged 94 years.

Head.—Brain normal.

Chest.—Old pleuritic on right side: lower lobe of both lungs hepatized; disease greatest in right; bronchial lining membrane thickened; right lung weighed 29½ ounces; left, 22½ ounces; atheromatous deposits in aorta; softening at one point.

Abdomen.—A number of hydatids of the genus *Echinococcus* in liver; cyst of the size of an orange; a large one on right kidney, containing 12 ounces of fluid; portion of kidney absorbed.

Case 305.—Aged 99 years.

Head.—Brain normal.

Chest.—Old pleuritic adhesions on both sides; hepatization of left lung; weight of lungs, 42½ ounces. Heart enlarged; weight, 14 ounces; bony deposit in mitral valves, also on arch of aorta.

Abdomen.—Small cysts on surface of kidney; upper portion of capsule of spleen thickened, and firmly adherent to diaphragm and omentum.

Of the 154 cases of pneumonia, 64 were males and 90 females. Among the *males*, the age varied from two weeks to 99 years. The greatest fatality has been among the very young. More than half the cases have occurred in children under 6 years, and one-third in those under one year; the most prevalent form of the disease, as it appeared among them, was that called lobular pneumonia. In 27 of the children, both lungs were affected. Where a difference in the amount of disease in either lung was observed, the right was the one found most extensively diseased. In 1 case, the upper lobes were affected and the lower comparatively healthy. In another case, the lower lobe of one lung was diseased,—the upper lobe of the other. In 6 cases, the right lung only was affected,—the left in 4. In more than half the cases, the lung or lungs were in an advanced stage of hepatization. In 1 case, there was an abscess in the lung; in another, tubercles. In 4, bronchitis; in 5, emphysema; in 1, pleuritis; and in 2, effusion into the pericardium.

Five were admitted with pertussis, 3 with measles, and 1 after measles; 2 were affected with a syphilitic eruption, 1 with œdema, 5 with diarrhœa, 5 with wasting, 5 with enlargement of the mesenteric glands; in 1, kidneys very pale; in 2, the liver was diseased; in 1, the pancreas was in an abnormal state; and in 1, the intestines.

The brain was congested in 9 cases; in a state of anæmia in 3; containing an unusual quantity of fluid in the ventricles in 2 cases; unusually firm in 1; soft in 1.

The remaining 30 cases were nearly all persons advanced in life. The brain was above the average weight in 5 cases; below it in 1; increased quantity of fluid in ventricles in 6; congested in 4; opacity of arachnoid in 3; softening in 1; old apoplectic cyst in 1; deposit in choroid plexus in 1 case. Both lungs hepatized in 10 cases; in 2, the upper lobes only were affected; the right lung in 11, and left in 10. In the majority, the disease was in an advanced stage. Old pleuritic adhesions in about half the cases; recent effusion of lymph in 5 cases; hydrothorax in 3 cases; abscess in lung in 1; gangrene in 1; tubercles in 6; emphysema in 3; bronchitis combined with pneumonia in 13 cases; ulceration of the larynx in 1. In one instance the diseased lung was more than three times the weight of the other one, being 73 ounces, and the other 24 ounces. Enlargement of the heart in 17 cases; increased quantity of fluid in the pericardium in 2; pericarditis and lymph in 2.

General enlargement of the abdominal viscera in 5 cases. Liver above the average weight in 7 cases; kidneys in 5; stomach in 4; organs below the average weight in 4 cases.

Average time in the infirmary of 32 of the children, 23 days; of 15 old, 60 years and upwards, 11 days.

TABLE II.—PNEUMONIA, (FEMALES.)

Case 309.—Aged 2 weeks.

Head.—Brain normal.

Chest.—Lower lobe of right lung and posterior part of upper lobe in a state of hepatization; left lung but slightly affected; weight, $1\frac{1}{2}$ drachms; right, 7 drachms.

Abdomen.—Organs normal.

Case 310.—Aged 4 weeks. Pertussis; voracious appetite; general wasting of body.

Head.—Difference between medullary and cineritious portions of brain indistinct.

Chest.—Lobular pneumonia of right lung; numerous purulent deposits in the lobules of the anterior edge of right, with the peculiar central depression; weight of lung, $1\frac{1}{2}$ ounce; left, 1 ounce.

Abdomen.—Mesenteric glands enlarged.

Case 311.—Aged 5 weeks.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the state of red hepatization.

Abdomen.—All the organs normal.

Case 312.—Aged 7 weeks.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the state of hepatization; weight of both lungs, $3\frac{1}{2}$ ounces. Heart, *foramen ovale* still patent.

Abdomen.—Organs normal.

Case 313.—Aged 8 weeks. Much dyspnœa.

Head.—Brain normal.

Chest.—Lobular pneumonia of the lower lobe and anterior portion of upper of right lung, and also of a portion of the lower lobe of left; weight of right lung, $1\frac{1}{2}$ ounce; of left, $1\frac{1}{2}$ ounce.

Abdomen.—Organs normal.

Case 314.—Aged 8 weeks.—No symptoms of illness observed till the day before death.

Head.—Brain normal.

Chest.—Posterior portions of lower lobes of both lungs, and anterior edge of left, in the state of hepatization; weight of lungs, $5\frac{1}{4}$ ounces.

Abdomen.—Organs normal.

Case 315.—Aged 10 weeks.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the first stage of hepatization; right lung weighed 1 ounce, 5 drachms; left, 1 ounce, 6 drachms.

Abdomen.—Organs normal.

Case 316.—Aged 3 months. *Dyspnœa.*

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the first stage of hepatization, and also centre of right, which weighed 2 ounces; left, $1\frac{1}{2}$ ounce.

Abdomen.—Organs normal.

Case 317.—Aged 3 months. *Measles.*

Head.—Congestion of the brain.

Chest.—Lobular pneumonia lower lobes of both lungs; some ecchymosis on their surface beneath pleuræ; right lung weighed $2\frac{1}{4}$ ounces; left, 2 ounces.

Abdomen.—Organs normal.

Case 318.—Aged 4 months. *Anæmia*; general wasting.

Head.—Brain normal.

Chest.—Lobular pneumonia of the lower lobe of right lung; weight of lung, $1\frac{1}{2}$ ounce; left, 1 ounce.

Abdomen.—Organs normal.

Case 319.—Aged 4 months.

Head.—Brain normal.

Chest.—Lower lobes and posterior portion of upper of both lungs in the first stage of hepatization; weight of lungs, 3 ounces.

Abdomen.—Spleen enlarged; weight, 1 ounce; other organs normal.

Case 320.—Aged 4 months. *General wasting.*

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the first stage of hepatization; weight, $2\frac{1}{2}$ ounces.

Abdomen.—Organs normal.

Case 321.—Aged 5 months. *Extreme emaciation.*

Head.—Brain normal.

Chest.—Lobular pneumonia in the third stage of the anterior thin edges of both lungs; right weighed 1 ounce, 2 drachms; left, 1 ounce, 1 drachm.

Abdomen.—Mesenteric glands enlarged.

Case 322.—Aged 5 months. *Mother an idiot.*

Head.—Brain normal.

Chest.—Lobular pneumonia; firm and dark-coloured lobules of the size of a pigeon's egg in lower lobes of both lungs; weight of lungs, 3 ounces.

Abdomen.—Mesenteric glands enlarged.

Case 323.—Aged 5 months. *Mother a patient in lunatic asylum; child brought up by hand.*

Head.—Brain normal.

Chest.—Hepatization of lower lobe of right lung; some lymph on pleura covering it; right lung weighed $2\frac{3}{4}$ ounces; left, $1\frac{1}{2}$ ounce.

Abdomen.—Mesenteric glands enlarged.

Case 324.—Aged 6 months. *Dyspnœa urgent.*

Head.—Brain normal.

Chest.—Lobular pneumonia in the third stage of lower lobes of both

ungs; vesicular deposits of purulent matter; right lung weighed 3 ounces; left, $2\frac{1}{2}$ ounces.

Abdomen.—Mesenteric glands enlarged.

Case 325.—Aged 6 months. Died in the mother's arms in the out-patients' room.

Head.—Brain normal.

Chest.—Right lung covered with lymph; induration of structure; lobular pneumonia of anterior edge of lower lobe of left lung; right lung weighed $3\frac{1}{2}$ ounces; left, $1\frac{1}{2}$ ounce.

Abdomen.—Liver and kidneys in a state of anæmia.

Case 326.—Aged 6 months. Eldest twin-sister to following.

Head.—Brain normal.

Chest.—Hepatization of lower lobe of right lung; weight of lung, $2\frac{1}{2}$ ounces; left, 2 ounces.

Abdomen.—Right kidney paler and smaller than left; weight, 1 ounce; left, $1\frac{1}{2}$ ounce.

Case 327.—Aged 6 months. Youngest and smallest twin-sister to the preceding.

Head.—Brain normal.

Chest.—Hepatization in lower lobe of right lung, and also of left; right weighed $1\frac{1}{2}$ ounce; left, $1\frac{1}{2}$.

Abdomen.—Mesenteric glands red.

Case 328.—Aged 7 months. Pneumonia consequent on measles.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the state of hepatization; structure firm; right lung weighed $2\frac{3}{4}$ ounces; left, $2\frac{1}{4}$ ounces.

Abdomen.—Mesenteric glands enlarged.

Case 329.—Aged 7 months.

Head.—Brain normal.

Chest.—Lobular pneumonia in the first stage of lower lobe of right lung; lower lobe of left partly in the first and partly in the second stage; right weighed 2 ounces; left, $2\frac{1}{2}$ ounces.

Abdomen.—Abdomen tumid; mesenteric glands greatly enlarged; some of them contained scrofulous matter.

Case 330.—Aged 7 months.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the third stage of pneumonia; weight of right, $3\frac{1}{2}$ ounces; left, $2\frac{3}{4}$ ounces.

Abdomen.—Organs normal.

Case 331.—Aged 7 months. Pneumonia combined with measles. Mother died in infirmary of phthisis a few weeks before.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in a state of hepatization, furthest advanced in right; some tubercles in its apex; right weighed $2\frac{1}{2}$ ounces; left, $2\frac{1}{2}$ ounces.

Abdomen.—Organs normal.

Case 332.—Aged 7 months. Pneumonia combined with measles; great emaciation.

Head.—Brain pale.

Chest.—Lobular pneumonia of lower lobes of both lungs; softening of their substance; weight of right, $3\frac{1}{2}$ ounces; left, 3 ounces.

Abdomen.—Liver fatty; weighed 13 ounces; kidneys pale; weighed 3 ounces.

Case 333.—Aged 8 months. Showed well-marked symptoms of laryngitis.

Head.—Brain normal.

Chest.—Lobular pneumonia in the stage of hepatization of the lower lobes of both lungs; weight of right lung, $2\frac{1}{2}$ ounces; left, 2 ounces; lining membrane of the trachea and bronchial tubes inflamed.

Abdomen.—Organs normal.

Case 334.—Aged 8 months. Some blood passed by stool six weeks before death ; occasional hæmoptysis.

Head.—Brain normal.

Chest.—Lobular pneumonia of lower lobes of both lungs in the first stage of hepatization ; bronchial lining membrane red ; right lung weighed $3\frac{1}{2}$ ounces ; left, $3\frac{3}{4}$ ounces.

Abdomen.—Mucous membrane of intestines pale ; liver large, weight 14 ounces.

Case 335.—Aged 9 months. Pneumonia combined with measles and pertussis.

Head.—Brain normal.

Chest.—Lobular pneumonia of both lungs ; left most extensively affected ; bronchial lining membrane red ; right lung weighed $2\frac{3}{4}$ ounces ; left, 3 ounces.

Abdomen.—Organs normal.

Case 336.—Aged 9 months. Measles five weeks before death ; vomiting, phlegm brought up ; inspiration $4\frac{1}{2}$ in the minute ; pulse 180.

Head.—Brain normal.

Chest.—Pneumonia, first stage, lower lobes of both lungs ; weight of lungs, 5 ounces ; ecchymosis on surface of beneath pleura ; muco-purulent matter in bronchial capillaries.

Abdomen.—Organs normal.

Case 337.—Aged 10 months. Body pale and much emaciated ; subject to convulsions for some months ; twin-brother died at the age of 5 weeks.

Head.—Brain congested ; about 3 drachms of clear fluid in the lateral ventricles.

Chest.—Lobular pneumonia in third stage, lower lobes of both lungs ; anterior edge of upper lobes very firm ; right lung weighed $2\frac{1}{4}$ ounces ; left, 2 ounces.

Abdomen.—Mesenteric glands enlarged.

Case 338.—Aged 10 months. Pneumonia combined with measles and colitis. A foundling.

Head.—An increased quantity of fluid in the lateral ventricles.

Chest.—Lobular pneumonia of lower lobes and inferior portion of upper of both lungs ; right weighed 2 ounces ; left, $2\frac{1}{4}$ ounces.

Abdomen.—A few small superficial ulcers on the mucous surface of colon.

Case 339.—Aged 11 months. Pneumonia combined with measles.

Head.—More than usual quantity of fluid in the brain.

Chest.—Lobular pneumonia, first stage, lower lobes of both lungs ; increased redness of bronchial lining membrane ; weight of lungs, 7 ounces.

Abdomen.—Intestines unusually pale ; semitransparent.

Case 340.—Aged 12 months. When attacked with pneumonia, a convalescent from measles.

Head.—About one ounce of clear fluid in the lateral ventricles of brain ; weight, $26\frac{1}{4}$ ounces.

Chest.—Lobular pneumonia in first stage of lower lobe of left lung ; right weighed $1\frac{1}{2}$ ounce ; left, $2\frac{1}{4}$ ounces.

Abdomen.—Organs normal.

Case 341.—Aged 13 months.

Head.—Lateral ventricles of brain contained about three drachms of clear fluid.

Chest.—Lobular pneumonia in third stage of anterior thin edges of both lungs, and also their lower lobes, especially the left ; right weighed $2\frac{3}{4}$ ounces ; left, 3 ounces.

Abdomen.—Organs normal.

Case 342.—Aged 13 months. Extreme emaciation ; body weighed only 5 lbs. 2 ounces.

Head.—Brain normal.

Chest.—Portion of lower lobes of both lungs in the state of hepatization ; right weighed 1 ounce ; left, $1\frac{1}{4}$ ounces.

Abdomen.—All the organs small.

Case 343.—Aged 14 months. A foundling child brought up by hand.

Head.—Brain normal.

Chest.—Structure of lungs unusually firm ; had the feel of leather ; weight of right, $2\frac{3}{4}$ ounces ; left, $1\frac{1}{2}$ ounce.

Abdomen.—Stomach and large intestines distended.

Case 344.—Aged 14 months.

Head.—Opacity of arachnoid ; about 1 ounce of clear-coloured fluid in the lateral ventricles.

Chest.—Hepatization of right lung ; some recently effused lymph on the pleura covering it ; left lung free from disease ; lungs weighed $7\frac{3}{4}$ ounces.

Abdomen.—Organs normal.

Case 345.—Aged 15 months. Pneumonia combined with pertussis.

Head.—Brain normal.

Chest.—Lobular pneumonia in the first stage of both lungs.

Abdomen.—Organs normal.

Case 346.—Aged 16 months.

Head.—Brain normal.

Chest.—Pleuritic adhesions on right side ; upper lobe of right lung in the third stage of pneumonia, also contained an abscess filled with pus, size of a walnut ; right weighed 7 ounces ; left, $3\frac{1}{4}$ ounces.

Abdomen.—Organs normal.

Case 347.—Aged 16 months. Great dyspnœa for three days before death.

Head.—Brain normal.

Chest.—Lobular pneumonia of lower lobes of both lungs ; bronchial lining membrane red ; right weighed $5\frac{1}{4}$ ounces ; left, 4 ounces. Heart, cavities distended with fibrin.

Abdomen.—Liver large and fatty ; weight, $17\frac{1}{4}$ ounces.

Case 348.—Aged 16 months. Pneumonia combined with measles.

Head.—Brain congested ; weight, $35\frac{3}{4}$ ounces.

Chest.—Lower lobes of both lungs in the first stage of pneumonia ; right weighed $3\frac{1}{2}$ ounces ; left, 3 ounces.

Abdomen.—Organs normal.

Case 349.—Aged 2 years. Pneumonia combined with measles and diarrhœa.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the first stage of pneumonia ; right lung weighed $5\frac{1}{4}$ ounces ; left, $4\frac{1}{4}$ ounces.

Abdomen.—Pancreas large and unusually firm ; weight, 1 ounce ; mesenteric glands enlarged.

Case 350.—Aged 2 years. Pneumonia combined with colitis and measles ; eruption appeared of a dull colour three days before death.

Head.—Brain normal.

Chest.—Lower lobe of left lung in the first stage of pneumonia ; right weighed $3\frac{1}{2}$ ounces ; left, $4\frac{1}{4}$ ounces.

Abdomen.—Lower portion of mucous membrane of colon and rectum covered with lymph.

Case 351.—Aged $2\frac{1}{2}$ years. Pneumonia combined with whooping-cough.

Head.—About 3 drachms of clear fluid in the lateral ventricles.

Chest.—Lobular pneumonia in third stage of lower lobes of both lungs ; right weighed $4\frac{3}{4}$ ounces ; left, $3\frac{1}{2}$ ounces.

Abdomen.—Organs normal.

Case 352.—Aged 3 years. Pneumonia combined with pertussis.

Head.—Brain normal.

Chest.—Hepatization of lower lobe of left lung ; effusion of lymph on

the pleura covering it ; lobular pneumonia of lower lobe of right lung, which weighed $4\frac{1}{2}$ ounces ; left, $4\frac{1}{2}$ ounces.

Abdomen.—Some patches of ecchymosis on the mucous membrane of the large intestines.

Case 353.—Aged 3 years. Measles short time after small-pox ; face swollen from influence of mercury on admission.

Head.—Brain normal.

Chest.—Both lungs in the third stage of pneumonia ; right weighed $9\frac{1}{2}$ ounces ; left, 8 ounces.

Abdomen.—Liver weighed $18\frac{1}{2}$ ounces.

Case 354.—Aged 3 years.

Head.—Brain normal.

Chest.—Some fluid in left pleural cavity, and lymph on left pleura ; left lung hepatized ; right healthy ; lungs weighed $8\frac{1}{2}$ ounces.

Abdomen.—Organs normal.

Case 355.—Aged 3 years.

Head.—Brain normal.

Chest.—Lobular pneumonia of lower lobes of both lungs ; intervening structure pale ; lungs weighed 12 ounces.

Abdomen.—Organs normal.

Case 356.—Aged 4 years.

Head.—Brain normal.

Chest.—Pleuritic adhesions on both sides ; lower lobe of left lung hepatized ; right weighed $4\frac{1}{2}$ ounces ; left, 6 ounces.

Abdomen.—Mesenteric glands enlarged.

Case 357.—Aged 5 years. Child at school till day before death.

Head not examined.

Chest.—Both lungs hepatized ; pleuritic adhesions of both sides ; a few tubercles in apex of left lung ; right weighed $8\frac{1}{2}$ ounces ; left, 8 ounces.

Abdomen.—Liver large, weighed 22 ounces ; other organs normal.

Case 358.—Aged 6 years. Pneumonia combined with measles.

Head.—Brain congested.

Chest.—Lower lobe of right lung in the first stage of pneumonia ; lobular in lower lobe of left, and small calcareous deposit in right lung ; weight of lung, $3\frac{1}{2}$ ounces ; left, 3 ounces.

Abdomen.—Organs normal

Case 359.—Aged 7 years. Pneumonia combined with whooping-cough.

Head.—Brain congested.

Chest.—Lobular pneumonia in third stage of lower lobes of both lungs ; right weighed 9 ounces ; left, $7\frac{1}{2}$ ounces.

Abdomen.—Organs normal.

Case 360.—Aged 9 years.

Head.—Brain normal.

Chest.—Hepatization of the entire of left lung ; some congestion of lower lobe of right ; weight, 7 ounces ; left, $11\frac{1}{2}$ ounces.

Abdomen.—Some fluid in the cavity of the abdomen.

Case 361.—Aged 14 years. Pneumonia, pericarditis, &c. Subject to dyspnoea.

Head.—Brain normal.

Chest.—Hepatization of lower lobes of both lungs, most extensive in right ; weight, $15\frac{1}{2}$ ounces ; left, 11 ounces. Pericardium adherent to heart, which was enlarged ; weight, $10\frac{1}{2}$ ounces.

Abdomen.—Liver enlarged ; weight, 58 ounces.

Case 362.—Aged 22 years. Pneumonia combined with measles ; dyspnoea ; florid complexion.

Head.—Brain congested.

Chest.—Lower lobe of right lung in the third stage of pneumonia ; lower of left in first stage ; emphysema of both lungs ; weight of lungs, $58\frac{1}{2}$ ounces. Heart enlarged ; weight, $13\frac{1}{2}$ ounces.

Abdomen.—Organs enlarged; liver, $7\frac{1}{2}$ ounces; stomach, $7\frac{1}{2}$ ounces; kidneys, $11\frac{1}{2}$ ounces; pancreas, $4\frac{1}{2}$ ounces; spleen, $5\frac{1}{2}$ ounces.

Case 363.—Aged 26 years. Gave birth to a child eight days before death.

Head.—Brain normal.

Chest.—Right lung in second stage of pneumonia; bronchial tubes filled with frothy muco-purulent matter; right lung weighed $28\frac{1}{2}$ ounces; left, $16\frac{1}{2}$ ounces.

Abdomen.—Interior of uterus rough, of a dark-brown colour.

Case 364.—Aged 30 years. Subject to palpitation; had an attack of rheumatism four months ago; illness followed by dropsical symptoms.

Head.—Brain pale; a considerable quantity of fluid beneath the arachnoid.

Chest.—Pleuritic adhesions on both sides; lower lobe of left lung in the third stage of hepatization; two cavities at base of the size of a pigeon's egg, containing purulent matter; some tuberculous deposits; right lung weighed 28 ounces; left, 30 ounces. Heart enlarged; some lymph effused on the surface of the pericardium; heart weighed $15\frac{1}{2}$ ounces.

Abdomen.—Liver enlarged and fatty; weight, 68 ounces; spleen, 9 ounces; kidneys, 10 ounces; stomach, $5\frac{1}{2}$ ounces.

Case 365.—Aged 30 years. Convulsions and stertorous breathing for nine hours before death.

Head.—Thickening of the arachnoid; some lymph on surface of right lobe of cerebellum; brain firm.

Chest.—Upper of right lung hepatized; lower lobes of both lungs congested; right weighed 33 ounces; left, 22 ounces. Heart large; weight, 11 ounces; mitral valves much thickened.

Abdomen.—Organs large; liver, 80 ounces; spleen, $20\frac{1}{2}$ ounces; stomach, 5 ounces; kidneys, 12 ounces.

Case 366.—Aged 33 years. Subject to convulsions from childhood. Had a comb driven into left temple while in a fit four years ago; a few months before had three ribs broken from the kick of a horse.

Head.—*Dura mater* lining left temporal bone; rough from granulations on its surface; surfaces of arachnoid adherent; also some granulations on *dura mater* lining left side of base of skull; substance of brain firm.

Chest.—Lower lobes of both lungs in the first stage of pneumonia; right weighed 10 ounces; left, $21\frac{1}{2}$ ounces.

Abdomen.—Organs normal.

Case 367.—Aged 42 years.

Head.—Brain normal.

Chest.—Lower lobe of right lung partly hepatized and partly congested; a tuberculous cavity of the size of a walnut in apex of left lung; right weighed 20 ounces, left, $16\frac{1}{2}$ ounces. Heart small; weight $7\frac{1}{2}$ ounces.

Abdomen.—Organs small; liver $32\frac{1}{2}$ ounces; stomach, 3 ounces; kidneys, $5\frac{1}{2}$ ounces; spleen, $2\frac{1}{2}$ ounces.

Case 368.—Aged 50 years. Affected with rheumatism; limbs contracted for four years.

Head.—Brain normal.

Chest.—Lower lobe of right lung in a state of hepatization; lower lobe of left congested; right weighed $22\frac{1}{2}$ ounces; left $14\frac{1}{2}$ ounces.

Abdomen.—Stomach, 8 ounces; kidney, $9\frac{1}{2}$ ounces; spleen, 6 ounces.

Case 369.—Aged 55 years. Oedema of lower extremities.

Head.—Brain normal.

Chest.—Right pleural cavity contained some fluid; lower of right and upper lobe of left hepatized; bronchial tubes contained muco-purulent secretion; lining membrane thickened; right lung weighed $19\frac{1}{2}$ ounces; left, $2\frac{1}{2}$ ounces. Heart enlarged; weight, 13 ounces.

Abdomen.—Liver weighed 50 ounces; kidneys small; weighed $6\frac{1}{2}$ ounces.

Case 370.—Aged 58 years. Orthopnoea.

Head.—Brain normal.

Chest.—Pleuritic adhesions on right side; upper lobe of left lung in the third stage of pneumonia; redness and thickening of the bronchial lining membrane of both lungs; right weighed $13\frac{1}{2}$ ounces; left, $17\frac{1}{2}$ ounces. Heart large; weight, $11\frac{1}{2}$ ounces. Bony deposits in aorta.

Abdomen.—Liver weighed 50 ounces; kidneys, 12 ounces.

Case 371.—Aged 58 years. Cachexia.

Head.—Brain normal.

Chest.—Hepaticization of lower lobe of right lung; some pleuritic adhesions; right weighed $28\frac{1}{2}$ ounces; left, $11\frac{1}{2}$ ounces; heart, $11\frac{1}{2}$ ounces.

Abdomen.—Liver large; weight, 67 ounces; stomach, 6 ounces; kidneys, 9 ounces.

Case 372.—Aged 60 years.

Head.—About 2 ounces of fluid in the lateral ventricles of brain.

Chest.—Posterior portion of upper lobe of right lung in the third stage of pneumonia; structure soft; small abscesses, size of a pea, lined by a membrane in lower lobe; right lung weighed 20 ounces; left, 16 ounces; redness and thickening of bronchial lining membrane. Heart enlarged; weight, 12 ounces.

Abdomen.—Organs rather small; liver, 37 ounces; stomach, 4 ounces; kidneys, 8 ounces.

Case 373.—Aged 60 years.

Head.—Congestion of brain; about 1 ounce of clear fluid in lateral ventricles.

Chest.—Inferior portion of upper lobe of right lung in the third stage of pneumonia; right weighed 40 ounces; left, $15\frac{1}{2}$ ounces. Heart enlarged; weighed $16\frac{1}{2}$ ounces.

Abdomen.—Organs enlarged; liver $52\frac{1}{2}$ ounces; stomach, $5\frac{1}{2}$ ounces; kidneys, $11\frac{1}{2}$ ounces; a fibrous tumour attached to uterus.

Case 374.—Aged 62 years. Ægophony on right side, posteriorly, for some weeks before death. No fluid found in chest.

Head.—Brain normal.

Chest.—Hepaticization of right lung; weight, $26\frac{1}{2}$ ounces; left lung, $13\frac{1}{2}$ ounces. Heart enlarged; weight, 14 ounces.

Abdomen.—Liver $43\frac{1}{2}$ ounces; stomach, $7\frac{1}{2}$ ounces; spleen, $6\frac{1}{2}$ ounces; kidneys, 5 ounces.

Case 375.—Aged 65 years.

Head.—Congestion of brain; weight, 48 ounces.

Chest.—Lower portion of right lung in the third stage of pneumonia; some lymph effused on its surface; redness and thickening of bronchial lining membrane of both lungs; right lung weighed 43 ounces; left 15 ounces. Heart, traces of old pericarditis.

Abdomen.—Gall-stone, of the size of a filbert, in gall-bladder, which also contained some colourless mucus; a fibrous tumour attached to fundus of uterus.

Case 376.—Aged 65 years.

Head.—Brain normal.

Chest.—Lower lobe of left lung in the third stage of pneumonia; some tubercles in both lungs; a cavity of the size of a bean in upper lobe of left; bronchial lining membrane thickened in both lungs; right lung weighed 19 ounces; left, 20 ounces. Heart small; weight, 6 ounces.

Abdomen.—Organs small; liver, 33 ounces; kidneys, 2 ounces; spleen, $2\frac{1}{2}$ ounces.

Case 377.—Aged 68 years. *Diabetes mellitus* is stated to have existed in this case some months before admission.

Head.—Congestion of brain; about two ounces of clear fluid in the lateral ventricles; brain firm.

Chest.—Upper lobe of left lung œdematous; structure soft; right lung weighed 14 ounces; left, $27\frac{1}{2}$ ounces; heart, $11\frac{1}{2}$ ounces.

Abdomen.—Liver weighed 40 ounces; kidneys, 12 ounces.

Case 378.—Aged 68 years.

Head.—Brain normal.

Chest.—Induration of structure of upper lobe of right lung; muco-purulent secretion in the bronchial tubes; redness and thickening of their lining membrane; right weighed 16 ounces; left, 15 ounces; heart, 9½.

Abdomen.—Organs small; liver 36 ounces; spleen 2½ ounces; wasting of right kidney; weight, 1½ ounce; its pelvis filled with calculi; left kidney weighed 4½ ounces.

Case 379.—Aged 68 years. Hemiplegia of left side for a number of years; erysipelas of right thigh and leg, and gangrene of great toes.

Head.—An old apoplectic cyst, size of a pigeon's egg, above and external to left lateral ventricle, containing some fluid, and lined by a membrane; a small cavity of same description below in middle lobes.

Chest.—Lower lobe of left lung and posterior portion of its upper lobe in third stage of pneumonia; right lung weighed 15 ounces; left, 21 ounces; heart, 9½ ounces.

Abdomen.—Organs normal.

Case 380.—Aged 69 years. Admitted for influenza; died comatose.

Head.—About 1½ ounce of clear fluid in lateral ventricle of brain.

Chest.—Lower lobe of both lungs in third stage of pneumonia; structure softened; right weighed 28½ ounces; left, 30 ounces; heart, 11½.

Abdomen.—Organs normal.

Case 381.—Aged 70 years.

Head.—Congestion of brain.

Chest.—Lower lobe of left lung in the second stage of pneumonia; thickening and redness of the bronchial lining membrane; right lung weighed 16½ ounces; left, 35½ ounces.

Abdomen.—Organs normal.

Case 382.—Aged 70 years.

Head.—Brain normal.

Chest.—Lower lobes of both lungs in the third stage of pneumonia; weight of lungs, 63½ ounces.

Abdomen.—Organs normal.

Case 383.—Aged 71 years. Found dead in bed.

Head.—Congestion of brain.

Chest.—Lower lobe of right lung in the third stage of pneumonia; lower of left congested; right lung weighed 23 ounces; left, 14½. Heart enlarged; weight, 11½ oz.; mitral valve thickened, and contained earthy deposit.

Abdomen.—Organs normal.

Case 384.—Aged 71 years. A patient in Infirmary for two years with neuralgia of face, for which she had taken large quantities of iron.

Head.—Congestion of brain.

Chest.—Old pleuritic adhesions on both sides; some recently effused lymph on posterior portion of lower lobe of right lung; this portion of lung soft and infiltrated with reddish fluid; right lung weighed 20 ounces; left, 10 ounces; muco-purulent matter in bronchial tubes, and thickening of their lining membrane. Heart weighed 7½ ounces.

Abdomen.—Organs small; liver, 31 ounces; stomach, 4 ounces; kidneys, 7 ounces; spleen, 2½ ounces; pancreas, 2 ounces.

Case 385.—Aged 72 years. Dysphagia; great emaciation.

Head.—Brain normal.

Chest.—Lower lobe of left lung in the third stage of pneumonia; right lung weighed 13 ounces; left, 26 ounces; heart, 10 ounces.

Abdomen.—A scirrhus tumour of the size of a pigeon's egg attached to the œsophagus about a-half an inch above the stomach; organs small; liver, 25 ounces; spleen, 2 ounces; kidneys, 5 ounces; stomach, 3 ounces.

Case 386.—Aged 73 years.

Head.—Wasting of convolutions of brain, and mark of absorption on *corpus striatum*; weight 35½ ounces.

Chest.—Induration of lower lobe of right lung; congestion of lower lobe of left; emphysema of upper lobes of both; thickening of the bronchial lining membrane; right lung weighed 24 ounces; left, 18½ ounces.

Abdomen.—Organs small; liver 33 ounces; spleen, 3 ounces; stomach, 2½ ounces; kidneys, 7 ounces; pancreas, 2.

Case 387.—Aged 74 years.

Head.—Brain normal.

Chest.—Lower lobe of right lung in the third stage of pneumonia; congestion of lower lobe of left; right weighed 36 ounces; left, 17 ounces; heart, 10 ounces.

Abdomen.—Liver, 33½ ounces; stomach, 5½ ounces.

Case 388.—Aged 75 years.

Head.—Brain normal.

Chest.—Old pleuritic adhesions; lower lobe of right lung in the third stage of pneumonia; softening of structure; general dilatation of the bronchial tubes; ossific deposits in their rings; thickening of the lining membrane; right lung weighed 20½ ounces; left, 11 ounces. Heart small; weighed 6 ounces.

Abdomen.—Organs wasted; liver, 19½ ounces; kidneys, 5 ounces; stomach, 1½ ounce; spleen, ¾ ounce; pancreas, 1½ ounce; uterus, ½ ounce.

Case 389.—Aged 75 years. Pneumonia with empyema. Admitted in a dying state.

Head.—Brain normal.

Chest.—Right pleural cavity contained about 6 ounces of sero-purulent fluid; pleura of same side covered with recently effused lymph; lower lobe of right in the third stage of pneumonia; a tuberculous cavity of the size of a walnut in the apex of each lung; bronchial lining membrane of both lungs red and thickened; right weighed 33½ ounces; left, 20½ ounces. Heart large, 12½ ounces.

Abdomen.—Organs enlarged; liver, 51 ounces; pancreas, 3 ounces; stomach, 7½ ounces; the hour-glass contraction; a small ulcer on its surface in process of healing.

Case 390.—Aged 78 years.

Head.—Brain small; weight, 36½ ounces.

Chest.—Lower lobe of right lung in the third stage of pneumonia; redness and thickening of the bronchial lining membrane; dilatation of the tubes; right lung weighed 23½ ounces; left, 16 ounces.

Abdomen.—Organs normal.

Case 391.—Aged 78 years.

Head.—Brain normal.

Chest.—Pneumonia in third stage of lower lobe of right lung; œdema of posterior portion of upper lobe; right lung weighed 24 ounces; left, 14 ounces; heart, 7½ ounces.

Abdomen.—Organs small; liver, 34½ ounces; kidneys, 5½ ounces; stomach, 4¾ ounces.

Case 392.—Aged 82 years.

Head.—Wasting of brain; fluid beneath the arachnoid; weight of brain, 35½ ounces.

Chest.—Lower lobe of right lung in the third stage of pneumonia; structure soft; thickening of the bronchial lining membrane; right lung weighed 32 ounces; left, 16 ounces; heart, 10 ounces.

Abdomen.—Liver 43 ounces; kidneys, 6 ounces; stomach 4 ounces.

Case 393.—Aged 82 years. Cough of some years standing.

Head.—Brain normal.

Chest.—Recent pleuritic adhesions of lower lobe of left lung, which was in the third stage of pneumonia; redness and thickening of the bronchial lining membrane of both lungs; right lung weighed 14½ ounces; left, 33 ounces; heart, 10 ounces.

Abdomen.—Liver weighed $39\frac{1}{2}$ ounces; stomach, $6\frac{1}{2}$ ounces. A large inguinal hernia on right side.

Case 394.—Aged 82 years.

Head.—Brain weighed $40\frac{1}{2}$ ounces.

Chest.—Lower lobe of left lung indurated; congestion of lower lobe of right lung; redness and thickening of the bronchial lining membrane of both lungs; right, 17 ounces; left, $20\frac{1}{2}$ ounces. Heart small, $5\frac{1}{2}$ ounces.

Abdomen.—Organs small; liver, 29 ounces; spleen, $3\frac{1}{2}$ ounces; stomach, $3\frac{1}{2}$ ounces. Cysts filled with fluid on surface of kidneys.

Case 395.—Aged 84 years.

Head.—Opacity of arachnoid; wasting of brain; weight, 36 ounces.

Chest.—Lower lobes of both lungs softened in structure; most so on right; redness and thickening of the bronchial lining membrane; right lung weighed $18\frac{1}{2}$ ounces; left, $13\frac{1}{2}$. Heart large; weight, $10\frac{3}{4}$ ounces.

Abdomen.—Liver, 45 ounces; spleen, $5\frac{1}{2}$ ounces; kidneys, $6\frac{1}{2}$ ounces.

Case 396.—Aged 84 years.

Head.—Brain normal.

Chest.—Old pleuritic adhesions on left side; lower lobes of both lungs greatly softened in structure. Heart small, weight, $5\frac{1}{2}$ ounces.

Abdomen.—Organs wasted; liver, 20 ounces; spleen, 1 ounce; kidneys, 7 ounces; stomach, 4 ounces; pancreas, 1 ounce.

Case 397.—Aged 85 years.

Head.—Brain weighed $37\frac{1}{2}$ ounces.

Chest.—Lower lobe of left lung in an advanced stage of pneumonia; congestion of posterior portion of upper lobe; right weighed 13 ounces; left, $20\frac{1}{2}$ ounces; heart, $9\frac{1}{2}$ ounces.

Abdomen.—Liver, $40\frac{1}{2}$ ounces; kidneys, $7\frac{1}{2}$ ounces.

Case 398.—Aged 88 years.

Head.—Softening and congestion of brain; serous effusion beneath arachnoid.

Chest.—Lower lobe of left lung in an advanced stage of pneumonia; an abscess containing thick matter in its apex; muco-purulent matter in the bronchial tubes; congestion of lower lobe of left lung; right lung weighed $23\frac{1}{2}$ ounces; left, 31 ounces. Heart small, contained some fibrin partially softened; weight, $6\frac{1}{2}$ ounces.

Abdomen.—Organs below the average weight.

Of the 90 cases of pneumonia occurring in females, the ages vary from two weeks to 88 years; 53 cases were under the age of fourteen years; of these 31 were under one year. There was lobular pneumonia in twenty-two cases; in most of these the thin edges of the lungs were involved. Both lungs were affected in 37 cases: lower lobe of right and upper lobe of left in one; tubercles in upper lobe of right lung in six cases; in left lung, six; abscess in one; pleuritis in nine; bronchitis in three; ecchymosis beneath the *pleura pulmonalis* in two.

Abdomen contained a quantity of fluid in one case; organs enlarged in eight, wasted in seven. Enlargement of mesenteric glands in ten; ulceration and other diseases of intestines in six cases.

Congestion of the brain in six cases; opacity of arachnoid in one; abnormal quantity of fluid in the ventricle in seven; other diseased conditions in two cases.

Pneumonia was combined with rubeola in thirteen cases; with pertussis in five; dyspnoea, in three; hæmoptysis, in two; diarrhoea,

in two; laryngitis, one; convulsions, one; marasmus in six; sudden death, three.

Residence in the infirmary varied from one to 78 days; the average in each case, 14 days.

The remaining 37 cases were adults, the greater number being advanced in life, several of them inmates of the chronic wards of the workhouse, affected with other diseases, being confined to a horizontal or bent posture for a length of time. In all such cases, the structure of the depending portion of the lungs was softened and infiltrated with sero-sanguinolent fluid, presenting a peculiar morbid appearance, quite different from that observed in younger subjects.

In 8 of the 37 cases, the brain was congested; thickening on adhesions of the arachnoid in four; an increased quantity of fluid in the ventricle in seven cases; an old apoplectic cyst in one; other abnormal states, four.

Chest.—There were pleuritic adhesions in seven cases; serous effusion in three; pneumonia in an early stage in five cases, and in more advanced, 32. Right lung principally affected in 15 cases, left in seven. Both lungs in eight; confined to upper lobe of right in three; upper lobe of left in one; upper lobe of both in one; upper lobe of left and lower lobe of right in one. Congestion combined with pneumonia in seven cases; bronchitis in 15; emphysema in three; tubercles and small tuberculous cavities in five. In one instance, the diseased lung was nearly three times the weight of the other, the one being 15 ounces, the other 43 ounces in weight.

There was pericarditis in one case. The heart was above the average weight in 20 cases, and below it in nine.

The abdominal organs were above the average weight in 10 instances, below it in 15; there were schirrous tumours in one; gall-stones, one; disease of uterus in three. In most of the cases of enlargement of the abdominal viscera, there was also enlargement of the heart. To this there were some exceptions. In one case it was combined with hemiplegia, erysipelas with convulsions in two; dysphagia in one; great debility in two; dropsy in two; fever in one; orthopnoea in two; with rheumatism in one; measles in one; sudden death in two. Average residence in infirmary 17 days.

ART. IV.—*Observations on Hectic Fever*. By EDWARD OCTAVIUS HOCKEN, M. D., F. R. M. C. S. &c.

HECTIC, or habitual fever, is a disease on which many, and by no means clear opinions are held; some authorities limiting its application to particular states of disease, although essentially si-

milar symptoms may exist altogether independent of, and distinct from them. It has been defined * as a form of remittent fever of long and indefinite duration, consisting of an exacerbation once or sometimes twice a day, attended with extreme attenuation of the body, and depending either on suppuration or upon important organic derangements of structure. But as exactly similar phenomena may come on from loss of blood, undue lactation, or from any cause which debilitates and deranges the general system to any considerable degree, without suppuration or organic disease in any part, such a definition is evidently partial and incomplete, since the general symptoms which arise from sympathy no more deserve the name of hectic, than those originating in the general affections which I have mentioned. Hectic fever, moreover, is not so invariable in its symptoms, nor so regular in the manner and succession in which these symptoms develop themselves, as to warrant the short and cursory description usually given. It is a state of habitual and continued febrile action, with occasional paroxysms of cold, heat, and perspiration; but still hectic may be present if there be but one symptom essentially febrile in its nature. Dr Latham used to state in his lectures that "hectic was sometimes unlike itself;"—alluding to the occasional absence of the more prominent, and generally allowed phenomena of the disease.

Hectic usually presents occasional paroxysms of cold, heat, and perspiration, analogous to the paroxysm of an intermittent, in which the stage of perspiration greatly exceeds the two former. In their origin, however, there is no connection between these two fevers, whereas the latter owns a malarious origin, the former, as I shall proceed to show, is a disease essentially dependent on debility. All the symptoms are those of a want of power; a desire to perform functions which the system is incompetent to perform efficiently; of action without power; irritation without tone. The disease may, in fact, be produced by any cause which debilitates the constitution; and at the same time increases the susceptibility of the nervous system. Hectic fever is then divisible into constitutional and sympathetic forms.

Constitutional Hectic.—Conditions of habitual fever are very apt to come on in cases of simple genuine debility. Patients complain of general atony, more or less shortness of breath, some derangement of stomach, (and, if a female, of the uterus); they have a quick, weak pulse, flushing of the cheeks, tendency to perspiration, nervous excitability, and perhaps, regular paroxysm at night, or noon and evening.

The train of symptoms which come on from undue lactation are those of genuine hectic, which develop themselves in delicate constitutions soon after the mother commences suckling, or in

* Dr Christison, *Lib. of Medicine*, Vol. i. p. 286.

healthier individuals after a more prolonged period, when they have continued suckling too long. They begin to complain of painful sinking at the stomach, and a sense of overpowering debility; but as they continue the cause, so naturally the affection increases in severity. The cheeks are marked by circumscribed flushing, and the skin is seldom free from perspiration in a palpable form. These cases afford excellent opportunities of watching the symptoms and progress of hectic, as it is wont to develop itself, commencing with mere debility and an habitually quick pulse, and going on to the severe and more numerous symptoms described by most authors. Debility may be local or general; and merely refers to the general or local inability of performing functions efficiently, although the affected organs are free from actual disease. In this sense undue lactation is essentially a disease of debility, in which the nervous system is unduly irritable; but wanting in power, and as hectic is developed under precisely similar circumstances, all its necessary elements are present; the debility, excitability, and hectic occur together, acknowledging the same cause, and showing their essential natures and relations.

The same symptoms result from reducing the strength, and increasing the irritability of the nervous system in any other manner. Many individuals become hectic from over-exerting themselves in mind and body for any length of time. Professional persons, merchants, and others, similarly situated, are occasionally exposed to predisposing and exciting causes sufficiently intense, and suffer in consequence. A gentle tonic, and relaxation from business, is sufficient to cure such patients, many of whom become nervous and anxious about themselves, suspecting the commencement of phthisis; and, in truth, if the case be neglected, especially where there is predisposition, slight constitutional ailments may pass on into a condition of tubercular cachexia, and end in confirmed consumption.

There are certain epochs of our existence when some material changes are effected in the system, demanding an unusual supply of nervous power, and requiring an extraordinary exertion to complete and perfect them; such, for instance, as the periods of puberty, or the transition from boyhood to manhood, and the climacteric decay, or transition from manhood to old age. A certain degree of hectic is almost sure to accompany these periods, which may be severe if the patient's constitutional powers be feeble, and favour the operation of these deranging causes. The diseases incident to these particular periods of life are interesting, and deserve the careful attention of all those engaged in the pursuit of medical knowledge.

Hunter * remarks, that, although hectic arises commonly from

* Works by Palmer, Vol. iii. p. 509.

some incurable local disease of a vital part, or of a part not essential to the continuance of life when of some magnitude, yet it is possible for it to be an original disease in the constitution; the constitution may fall into the same mode of action without any local cause whatever, at least that we know of.

Hectic, he adds, may be said to be a slow mode of dissolution; the general symptoms are those of a low or slow fever, attended with weakness, but more with the action of weakness than real weakness; for upon removal of the hectic cause, the action of strength is immediately produced, as well as every natural function, however much it was decreased before. The particular symptoms are debility; a small, quick, and sharp pulse; the blood forsaking the skin; loss of appetite; often rejection of all aliment by the stomach; wasting; a great readiness to be thrown into sweats; sweating spontaneously when in bed; frequently a constitutional purging; the water clear;* dissolution.

Hectic, as far as I have hitherto considered it, we have seen to consist of mere functional (in the ordinary acceptation of the term) derangement of the constitution, essentially consisting of increased excitability and diminished power. Each particular organ strives to perform its appropriate function, but fails from a mere want of tone. In due time the constitution becomes conscious of these ineffectual efforts, and becomes, as it were, "teased;" and this "teasing," as Hunter denominates it, constitutes the essential cause of hectic, which manifests itself in some or all the symptoms already mentioned. The constitution is irritated by many local derangements, which, although not incurable in themselves, it is incapable, at the time, of curing itself, by its own unaided powers, and hence, as it were, owns its inability by the strivings of hectic.

I now proceed to consider hectic as a sympathetic disorder; either where the constitution sympathises with disease in a vital organ, or in parts of less importance in the animal economy. The pathology of this form of hectic is, however, essentially similar to that already discussed: it is, in fact, merely that derangement of the system which results from a consciousness of inability on the part of the constitution to effect a cure in the seat of disorder, either from the incurable nature of the disease, or from the particular conditions of the disease and constitution, although it is perfectly curable in its essential nature, rendering it incurable at the time.

Sympathetic Hectic.—In the consideration of this form of hectic, it will be well to bear in mind the natural divisions of the subject into the sympathy of the constitution with non-vital parts

* Although the urine, as Hunter says, is passed clear, still it deposits, on cooling, a pink sediment, the purpurate of ammonia. In his lectures (Vol. i. p. 432) he says the urine is clear at one time, and at another deposits a branny brick dust sediment.

in a state of disease, for the time incurable, either from its extent, situation, or mode of action with non-vital parts affected with disease incurable in its nature; sympathy with vital parts suffering from disease not incurable *per se*; and, lastly, sympathy with parts essential to the continuance of life suffering from incurable organic disease. Exactly the same symptoms may come on from local disease in an unhealthy constitution, which disease would have been readily curable and cured in a healthy one, as would occur in a healthy constitution from disease so situated as to be unfavourable for the healing process; hence, we may reiterate the caution of Hunter, that a careful diagnosis should be made between hectic arising entirely from a local complaint, where the constitution is good, but only disturbed by an excess of irritation, and hectic arising principally from an unhealthy condition of the constitution, which does not dispose the parts for a healing state.

Severe injuries, especially of parts far removed from the centre of circulation, as the lower extremities, are very apt to be followed by sympathetic hectic, during the processes preceding active reparation. This is the case likewise in most forms of prolonged, passive, or inactive inflammations of any extent, especially such as we see in the osseous system. Diseased bones and joints require much time for their terminations in health, loss of life, or more or less serious injury to their healthy structure; hence, they generally furnish frequent and painful illustrations of severe hectic. One law seems to belong to all these cases of simple local diseases, viz. that the further they are removed from the centre of the circulation, provided that the amount of disease be similar, the more certain is hectic to accrue, and the sooner it will come on.

When hectic arises from disease in a part not vital, Hunter says,* it is generally in parts where such a quantity of mischief can take place, as to make the constitution sensible of it, as the large joints, and also in such parts as have naturally but little power to heal. In small joints, although the same local effect takes place as in large ones, yet the constitution is not made sensible of it, so that we find scrofulous disease of the smaller joints, as a toe or finger, going on for years without affecting the system. The ankle, elbow, and even shoulder, are much longer in affecting the constitution with their want of power to heal than either the knee, hip-joint, or loins.

It is curious to see how suddenly the constitutional disturbance changes from inflammatory fever, in acute active inflammations, to hectic, when suppuration has commenced. Cold, followed by heat and perspiration, ushers in the abscess, and the hectic denoting its formation. Dr Billing supposes that a portion of the inflamed tissue, constituting the centre of the disease, perishes, and

* Loc. cit. Vol. i. p. 432.

that the rigor denotes this change, that suppuration is subsequent to this limited sloughing, following it as a reparative process, connected with the separation of the dead portions, and reparation by granulation, but that this intention is frustrated by the retention of the secreted pus. Is not this a more ingenious than probable explanation?

From the moment of formation to the completion of reparative processes, hectic fever attends the progress of abscess, when it is of sufficient extent, with the exception of some cases of chronic abscess. The pulse, from being hard, becomes quick and irritable; the skin, from being hot and dry, soft and moist with perspiration; the tongue and mouth red and liable to aphthæ; paroxysms of fever having an intermittent type, with great reduction of the general strength. These symptoms are especially seen where there is a profuse discharge of pus from an abscess, or a profuse secretion from a suppurating surface.

Where the disease is in its nature curable, but is not cured, owing to fortuitous circumstances, the practitioner may often produce a recovery from the hectic by aiding the work of reparation, sometimes by local and sometimes by constitutional measures, but in general by both. In one case, we give sufficient tone to the system to enable it to cure the local disease; in the other by curing the local disease, and removing the sources of depression and irritation, we remove the source of the hectic, and thus cure the constitution. Where the disease is incurable in its nature, or so circumstanced that we cannot cure it, the removal of the part by surgical means, if it be practicable, will, in like manner, cure the hectic.

Hectic takes place in a great number of diseases in parts of vital importance in the economy, whether curable or incurable in their natures, which, situated elsewhere, would produce few constitutional symptoms worthy of note. Thus diseases of the respiratory organs, of the intestinal canal, and connected apparatus, the genito-urinary system, &c., produce hectic much oftener and sooner than disease in less important parts. It often occurs from chronic diseases of these important organs, curable in their natures, but still oftener from incurable affections, either essentially so, or incurable in that individual. It forms the type of constitutional derangement previous to the commencement of reparation, and indicates that the part is making no useful efforts for its own restoration to health.

In no disease is hectic more common than tubercular phthisis, and in no other complaint do we see it assume greater varieties of shade and character, according as the local disease varies in extent, duration, stage, rapidity, and in its complications. For, as the local disease may at one time present extensive tubercular depo-

sits, abiding long without change, and unattended by inflammation, and then suddenly assuming a fearful activity, at another comparatively small crops going through their peculiar changes, steadily and quickly to be followed, at no remote period, by a similar crop, undergoing similar changes; in a third small miliary tubercles scattered widely through the lung, scarcely to be recognized by auscultation; and, lastly, cases where there is just sufficient inflammation to occasion the softening and expectoration of the tubercles, and no more, and cases where the inflammation exceeds this point, both in degree and extent, differing in different instances, so also does the hectic vary in all and each stage and form. Cases of phthisis present every intermediate degree of hectic, from a slight acceleration of the pulse to the most striking forms of emaciation, flush, colliquative diarrhœa, paroxysms of cold, heat, and perspiration; pearly appearance of the eyes, and debility. Abscesses and fistulæ are apt to occur about the anus during the softening and expectoration of the tubercles, and aphthæ and troublesome ulcerations, especially during the latter stages of the affection. Hectic is a symptom of constitutional irritation from other incurable diseases of the respiratory system, liver, &c. &c., and we learn the site of the producing disease by the peculiar symptoms which the impeded or deranged function of the suffering organ occasions. We have, however, no right to conclude that organic disease is present from the symptoms of hectic alone, if the senses of hearing, feeling, and seeing, combined with the information derived from the patient, fail to detect any, since mere general debility, with increased excitability of the nervous system, is amply sufficient to account for its presence, and tonics, with carefully regulated diet, to cure it.

Some of the more chronic forms of infantile remittent fever approach very near to hectic in their characters; and idiopathic fever, after having reduced the general powers to a sufficiently low ebb, often degenerates into true and genuine hectic.

The constitutional forms of syphilis also afford frequent specimens of hectic fever, differing much in intensity and form. Some of the worst cases occur in the more severe forms of pustular syphilitic eruptions, with bad ulcerations, rupia, &c., or in the ulcerating stages of tuberculæ. The cases present great constitutional debility and cachexia, and are most beneficially and remarkably influenced by the iodide of potassium, in moderate doses, and where there is pain, with opium.

The foregoing remarks contain an outline of the pathology of hectic fever, in which it has appeared that an essential feature in every form of the complaint often, as Dr Latham says, "unlike itself," is debility, whilst a part or parts strive to perform its or their functions aright, but are, for the time, incapable of doing so.

Hence it would appear that the fever is essentially a fever of debility, and on this knowledge mainly hinges its treatment. Whatever local treatment be required, the general symptoms demand a tonic plan of proceeding. In many cases where we are obliged to leech and cup locally, we must treat the fever by nutritious diet, adapted to the condition of the digestive organs, tonics, and even stimulants,—a plan of proceeding often necessary and advantageous in other diseases, but not so generally understood and acted upon as it should be. We may be called upon, moreover, to treat particular symptoms when urgent, such as sweating, purging, &c. by medicines and plans understood by all well-informed practitioners.

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ART. V.—*Case of temporary poisoning by swallowing incautiously a large quantity of Hydrocyanic Acid, terminating in recovery.* By Mr GEORGE GARSON, Surgeon, Stromness, Orkney.

On the morning of the 23d of May last, I was called out of bed to visit Mr A. W., aged 24, and arrived at his residence, distant a couple of minutes walk, about 7 A. M., when I received the following account. After 6 A. M. he arose, dressed, and went into an adjoining room to write. There he made use of a tobacco pipe, and ordered a tumbler, which was brought him. He then wished to bolt the door, so as to secure himself against intrusion whilst writing, but from this he was dissuaded. Having been in this room for a little time, he returned to his bed-room, and within five minutes was heard to groan. His sister immediately entered the room, and found him in bed, under the clothes, without his coat and waistcoat, unable to speak, and with his eyes fixed.

When I arrived I found him breathing irregularly, occasionally moaning, having the jaws fixed, and the teeth of the inferior retracted within those of the superior; the face covered with cold perspiration; the eyes open; the eyeballs turned upwards; the pupils of natural size, or perhaps a little contracted and insensible; a gurgling noise in the throat; and the pulse weak and quick. I observed on the blankets a small quantity of brownish tenacious matter which had fallen from his mouth. It had a strong odour, which at the time I ascribed to whisky, whereof a small quantity had been put into his mouth previous to my arrival.

I knew that, some months before, he had taken opium in pretty large doses, and of this substance there was now found in his pocket a piece of considerable size, but bearing no traces of having been lately diminished. On two or three occasions within the last

month I had supplied him with a mixture containing hydrocyanic acid, for relieving uneasy sensations about the head and heart, of which he had long complained, particularly when much confined to the house; but the last dose had been taken some days before. During a conversation I had with him subsequent to his taking the last dose of my mixture, he told me of hydrocyanic acid which a friend had left with him, but of little or no strength he thought, as it had been long kept, and on taking a dose, he did not experience the wonted relief. In a phial was found in the drawer of a table in his room labelled "hydrocyanic acid," and empty. A number of unsealed letters were found in his writing-table, but no conclusions as to his present state could be drawn from them.

From our previous acquaintance I could not entertain the thought that hydrocyanic acid had been taken in order to destroy life, whilst a full consideration of the foregoing circumstances impressed me with the idea that an over-dose of the acid was the cause of his dangerous state. I was also strengthened in this by something in his appearance, which it is impossible to communicate in writing.

I forthwith proceeded to treat him for having taken an over-dose of hydrocyanic acid, by pouring cold water along the spine, and in order to have easier access, had him removed to the floor. Water was employed at intervals for about an hour and a-half. Occasionally towards the end of this time he was turned on his back, and some ammoniated alcohol introduced into his mouth, with a solution of chloride of lime, the latter prepared on the spur of the moment from chloride of lime, as the only ready means for obtaining chlorine. Twice or thrice he was observed to swallow these medicines. The pulse had by this time become quicker, and less distinct, and the action of the heart could scarcely be felt whilst lying on his back. The limbs cooled considerably, and the integuments about the neck and breast became livid and of a yellowish tinge. Cold water was now poured on the forehead; mustard cataplasms applied to the legs, arms, and breast; and hot stones to the feet. Rubescence appeared on the arm in twenty minutes, and on the legs in forty; the fore-arm became stiff and inflected on the arms, and the face flushed; the breathing was still irregular, and moaning. He was bled to eight or ten ounces. Convulsions became stronger. He drew himself up in his seat, supported behind by the right arm, contracted the inferior extremities, and with a fierce look and fixed eye, uttered three hideous groans, then twisted his body toward the left side, with the face to the floor, when cold water was again poured along the spine. By this time three hours and a-half had elapsed. The convulsions never returned with such violence; the temperature of the extremities increased. He was now put to bed surrounded with bottles of hot water.

Four drachms of ammoniated alcohol, as much solution of chloride of lime, and some brandy had been already administered. I did not judge it prudent to exhibit more either of ammonia or chloride, but administered tea-spoonfuls of brandy as deglutition was performed. About the expiry of another half-hour, he became sensible, acknowledged that he had taken a little hydrocyanic acid, and made no complaints except of thirst and heat about the throat. Rigors followed, which disappeared after swallowing his coffee and brandy. In the evening I found that he had vomited frequently during the day, suffered from sore throat, which hindered deglutition, the saliva being abundant, and flowing out at the mouth. He had a frequent cough. Next morning he was much relieved, and in a few days more was quite well, with the exception of the outer side of his right foot, which was blistered from the application of a hot stone.

He does not know accurately what quantity of acid he swallowed, but believes that it at least equalled a tea-spoonful. He took this quantity because he had passed a restless night, and wished to compose himself for writing, believing that the acid had lost its strength, and was now almost useless. Feeling chillness, he went to bed, intending in a little time to rise and walk; he thinks that a quarter of an hour elapsed between taking the acid and going to bed. He wrote in the interval.

From the facts now stated, it seems impossible to doubt that hydrocyanic acid had been taken. The case is useful, in showing how long an interval may elapse between the taking of the poison and the development of the symptoms, and also the long continuance of the operation of the acid on the system.

ART. VI.—*On the injurious effects of long-continued severe exertion and fatigue on the health of Europeans in India.*

By ARTHUR THOMSON, M. D., Assistant Surgeon 14th Light Dragoons.

THERE is a common opinion among military men, that although a campaign may prove fatal to the young and delicate soldier, yet those who survive the fatigue become thereby much more robust, “having the iron constitution of a veteran,” and are said to be afterwards better able to resist disease and the injurious influence of a deleterious climate, than the young soldier who has not suffered either fatigue or hardship. That this opinion is not well founded in so far as regards the men who have come under my observation, will be seen from the following abstract; previous

to inserting which, I shall briefly give an account of the materials from which the results are deduced.

The 17th Regiment landed at Bombay from New South Wales in 1836. For two years and a-half it was stationed at Poona, during which time the men were healthy. In November 1838, the regiment left Poona to form part of the army of the Indus. In about fourteen months it traversed a distance of 1800 miles, or, from Kurachee, at the mouth of the Indus to Cabool, and from Cabool back to the same station, suffering during that period many privations, the extreme heat of a tropical climate, and the intense cold of an elevated temperate region during the winter months. The regiment was shipwrecked on its passage from Kurachee to Bombay, on a sand bank, and the men lost almost every thing; they were exposed for some days without shelter to a tempest of rain on the sea shore. The health of the men during the campaign was good, a considerable number of deaths occurred on the return of the regiment to the level of the sea, from pulmonic disease; a circumstance presumed to have been produced by the rapid change of climate and temperature.

An abstract, showing the average number of men in the 17th Regiment (for the year ending March 1841) who served during the Affghan campaign in 1839; and the average number of men in the regiment who had not been on the expedition, together with the number of admissions into hospital, and deaths among both classes.

	No. Admit. into Hosp.	No. of Deaths.	Intensity of Disease.	Ratio of Deaths.
Average number of men who served in the campaign, 450, }	1429	74	1 death for every 19 treated.	16 per cent. or 1 death for every 6 of the strength.
Average number of men in the regt. who had not served, 467. }	1095	33	1 death for every 33 treated.	7 per cent., or 1 death for every 14 of the strength.

The conclusions deduced from the above are as follow :

1st. The men who served during the campaign were more affected with the climate than the recruits.—Thus every old soldier was more than three times in hospital during the year, whereas the recruits had only about two admissions for every man.

2d, The intensity or fatality of the sickness was greater among the campaigners.—Thus one man died for every 19 treated among the old soldiers, whereas only one death occurred for every 33 recruits admitted.

3d. The ratio of mortality was greater among the old than the young soldiers.—Sixteen per cent., or about one death out of every six living occurred; while the recruits lost scarcely one-half of this proportion by deaths.

During the period the above deaths occurred, one wing of the regiment was stationed in Bombay, the other at Poona, and the wings changed stations at the end of six months; the chief diseases were fever and bowel complaints.

There is no other cause to which I can attribute this great difference in the amount of mortality among the men who had served during the campaign and the recruits, excepting the exhaustion of the constitution produced by the long and severe exertion to which they were exposed. Most of the men were under 30 years of age, and nearly all under five years' residence in India. Other circumstances (such as the campaigners having a considerable sum of money to spend) may have contributed to increase the sickness, but the difference is so great that some other cause must be looked to than this. In India a regiment is generally healthy during a march when cholera does not occur; but it is often observed that the sick list increases after their arrival at a new station. The exertion to Europeans of marching in India fifteen miles a-day is great, and to some men it is painful and laborious, and any fatigue which becomes painful is injurious.

Remarks.—The causes of disease when moderate, few in number, and not long continued, produce but slight and transitory effects. When, however, these causes are intense or violent in operation, numerous, or prevailing to a great extent, they are followed by well-marked and intense forms of disease. In all tropical climates the fatigue of ordinary duty to European soldiers is considerable, and is undoubtedly one of the exciting causes of disease; but its injurious influence is much less obvious than the severe exhaustion produced by a campaign. In a tropical climate the less fatigue Europeans are called on to make, the less will they suffer from disease, and the more effective will the soldier be when called on for great exertion. Deprive a man of his natural sleep every third or fourth night, and make him stand sentry for eight hours out of the twenty-four he is on duty, and you produce an amount of laborious and painful exertion which is always injurious to the constitution.

Every attention ought to be given to investigate the occasional causes of disease; for we cannot attribute the large mortality among European soldiers in tropical climates solely to the unavoidable influence of a deleterious climate. When we observe such a remarkable difference in the amount of mortality among Europeans in a tropical climate having the rank of commissioned officers, and that of private soldiers, other causes than simply that of climate must exist to produce that difference, and some of these causes of disease may, it is presumed, be obviated or greatly ameliorated.

ART. VII.—*An Account of several Cases of Spectral Illusions, with Observations on the Phenomena and on the states of bodily indisposition in which they occur.* By ROBERT PATERSON, M. D., &c. &c. Physician to the Leith Dispensary.

BEFORE detailing the cases of this curious affection which have come under my notice, a few very brief preliminary observations may not be unacceptable.

It appears to me that the steps or stages by which a healthy individual of strong imagination, or who is much occupied with the actions of his own mind, sees spectral illusions or appearances, are well-marked and simple of explanation.

Almost any individual can produce a spectral illusion in the following well known way. Look steadily for a time at the sun or the image of the sun, in a looking-glass, then turn the eye to any dark substance or to a dark corner of the room, and the retina for a moment will retain the impression of the sun,* but will almost be immediately succeeded by the spectral image of it. Sir Isaac Newton performed an interesting experiment of this kind, which, though well known, we may shortly, for the sake of illustration, relate here. "I looked," says he, "a very little while upon the sun in the looking-glass, with my right eye, and then turned my eyes into a dark corner of my chamber and winked, to observe the impression made, and the circles of colour which encompassed it, and how they decayed by degrees and at last vanished. This I repeated a second and a third time. At the third time, when the phantasm of light and colours about it were almost vanished, intending my fancy upon them to see their last appearance, I found to my amazement that they began to return, and, by little and little, to become as lively and vivid as when I had newly looked upon the sun. But when I ceased to intend my fancy upon them they vanished again. After this I found that, as often as I went in the dark, and intended my mind upon them, as when a man looks earnestly to see any thing which is difficult to be seen, I could make the phantasm return without looking any more upon the sun; and the oftener I made it return the more easily I could make it return again." A similar phenomena can be noticed by most individuals in looking fixedly at a window in a strong light, and then at the wall. The impression of the window is retained for a time upon the retina, but is soon succeeded by the spectral impression of the window with its panes and bars, which impression will be continued for a greater or shorter length of time, ac-

* I do not here at all refer to the subject of ocular spectra, or even the change of colour which is sometimes experienced when the spectral impression succeeds the real. I shall have occasion to speak of this afterwards.

according to the individual peculiarity. Such instances and experiments might be abundantly multiplied, but these will be sufficient to show the first stage in the observation of spectral appearances, viz. the retention of images upon the retina, which are succeeded, at shorter or greater length of time, by the spectral images of the object.

The next step is that of recalling impressions which have been for a time absent. This has already been illustrated in the case of Sir Isaac Newton, which I have just quoted, and Mr Boyle, in his work on colours, mentions the case of an individual who continued for years to see the spectre of the sun when he looked upon bright objects.

The gentleman, whose case I am shortly to relate, thus makes mention of the first time that he noticed his power of recalling images to his retina. When walking with a friend one evening by moonlight, Mr H. happened to look up and beheld the vane of a signal staff, having a large crown on it, directly between his eye and the lunar surface; so striking was the circumstance that he directed the attention of his friend to it, and they continued looking at it for a few minutes; they then proceeded onwards and had passed a large building before they again saw the moon, when to the astonishment of Mr H., the image of the crown and vane presented themselves to him alone on the lunar surface, as distinct as the real object had done a few minutes before. Such, then, appears to me, to be the second step in the observation of these phenomena, viz. the power of the mind in recalling images to the retina. From this, it is no great transition to pass on to those spectral appearances, which strike astonishment and terror to the strongest mind, which are not the offspring of loneliness or superstition, but occur in the centre of the family circle, and in the open light of day.

In attempting to explain, so far as we can, the manner in which a person of sound mind beholds those spectral appearances, we still find the subject surrounded with manifold difficulties.

Every one must have remarked the rapidity of mental power in recalling to recollection the image of objects which may be far distant. If we look, for example, at any large building, and without changing our position, recall to recollection some well-known distant object, the image of the building is momentarily displaced by the recollected image of the distant object, and it again appears as soon as we change the train of thought. This must be familiar to us all.

"From recalling images by an act of memory," says Dr Ferriar, "the transition is direct to beholding spectral objects which have been floating in the imagination;" and Dr Hibbert has elaborately shown that spectral appearances are nothing more than

ideas, or the recollected images of the mind, which, in certain states of bodily indisposition, are rendered as vivid as actual impressions. Dr Brewster has gone further than Dr Hibbert, and has simplified the subject much. He says, the above principle of Dr Hibbert has been placed beyond the reach of doubt; but I wish to show, that the mind's eye is actually the body's eye, and that the retina is the common tablet on which both classes of impressions are painted, and by means of which they receive their visual existence, according to the same optical laws. In this way do we understand how, as in the cases of Nicolai,* and Mr N., published by Mr Craig of Ratho,† when they beheld these phantoms both during the opening and shutting of the eyelids, how the phenomena are to be explained. The impression exists primarily on the mind, and is referred by its own conclusions to the natural organ where it ought to be formed, the retina, or the corresponding nervous department of the other senses.

How accurately has Shakespeare been acquainted with the recurrence of impressions. When Hamlet turns his recollection towards his father, the spectre of the ghost recurs to his eye; he sees his father, and being asked where, says, "In my mind's eye, Horatio." So, the description of the spectral appearance of Banquo, is perfect.

The soundness of the above remarks, we think, can hardly be questioned; they seem to offer so many links of a connected, though ravelled chain, which, however, we shall attempt to unloose further as we proceed.

1. The subject of the first case which I shall relate is a man of spare habit of body, of industrious and extremely temperate habits, and of education superior to the station of life in which he is placed. His occupation, for a series of years, has been that of an itinerant umbrella-maker, that is to say, he makes umbrellas at home, and travels through the country afterwards selling them. On one of these excursions, after much exposure to wet, he was seized with severe inflammatory sore throat, and afterwards with acute rheumatism. When the fever and rheumatic affection had passed off, he was left in a state of extreme debility; his digestive organs could not be brought into proper order, and he was subject to slight attacks of *tinnitus aurium* and giddiness of the head. About this time he became aware that the pages of all books appeared to him to be divided into two columns. This was especially annoying to him when he perused his larger print Psalm-book, which he well knew from long and frequent perusal not to be divided into columns. This illusion was at first alone confined to the pages of his books, but soon everything that he looked at presented a dark indefinite line dividing it into two

* Theory of Apparitions. By John Ferriar, M.D. of Manchester, p. 41.

† Edin. Medical and Surgical Journal, No. 129.

halves. He has frequently pointed out to me a blank perpendicular space dividing every body, into which he said he thought he could introduce his hand. On several occasions he made rather serious mistakes when he was able to go about and take walking exercise, by fancying that he was walking through a gap in a wall or paling, which illusion, however, disappeared upon his close approach. The most amusing, however, which he recounted to me, was an illusion which occurred to him on the streets of Edinburgh. It was among the first times that he had been able to go so far, and whilst walking along George's Street or Queen's Street, (I am not sure which,) he was astonished upon suddenly beholding the street divided in two halves, the one of which seemed to present a steep ascent, the other as steep a descent. The poor fellow said he was perfectly bewildered, yet nevertheless resolved, that, as he was going up to Edinburgh, the steep ascent was the one he ought to choose. He never fancied for a moment that this was an illusion, having never seen anything of the kind before, and fearlessly addressing himself to his journey, began to toil along the level street, as if he was going up a hill, to the no small amusement of a variety of passengers, who appeared equally to him to be toiling up and down the ascent or descent.

Soon after he had commenced climbing this imaginary steep, he discovered that he was still on level ground, and that it must be one of his illusions. This individual still enjoys very indifferent health, (and not unfrequently illusions of a similar kind are witnessed by him.) None have now been seen, however, for many months.

CASE 2. The next case is one of a very remarkable character; unfortunately, however, the illusion which I am about to describe only occurred once, and that at a considerable interval of time, but so strong is the recollection of it in the mind of the lady, that the most minute circumstances connected with it are at once recalled to her recollection; and I may state that, from the high respectability of the lady, the authenticity of the apparition is placed beyond the reach of question.

At the period of the occurrence which I am about to mention, Miss N. was just convalescent from an attack of slight fever, which had been of some duration, and had reduced her strength considerably. On the evening on which the illusion occurred, in the month of August, all the family had gone out early to an evening sermon, at some little distance. Miss N. not being allowed to go out at the time, was left the sole inmate of the house. Her father, an infirm old man, who seldom went much from home, was also out. She knew not, however, where he was, but fancied that he had gone to church with the other members of the family. It was a beautiful evening when they left the house, the day having

been very warm, and the atmosphere sultry, but they had not long ere some heavy clouds began to collect over head, and to betoken a storm. The anticipations from the appearance of the sky were not long in being realized, as it came on a most dreadful night of lightning and thunder, accompanied with heavy rain. Miss N. seated herself at a front window to watch the storm, which was then raging violently ; her mind unconsciously wandered upon her father, where he might be ; if at church with the rest of the family or elsewhere ; brooding on this circumstance, and being still rather weakly, she was consequently thrown into a state of considerable alarm.

The above minute particulars are necessary to show the state of mind in which Miss N. was at the time of seeing the illusion, as well as the causes which produced that state. I may also here mention that the lady is not in the slightest degree a believer in superstitious appearances.

Miss N., in the state of mind which I have just described, fancied that her father had been killed in the storm, and becoming very uneasy regarding him, she went into a back room which he generally occupied, and near the fire of which he usually sat in a high backed arm-chair. On entering the room, Miss N. was astonished to behold the image of her father in his usual dress and attitude, and seated by the fireside. Not fancying that it was an illusion, she immediately thought that he had entered the house without her having heard him, and going forward to lay her hand upon his shoulder, and inquire how he had got in, and repeating the word " father," she attempted to lay her hand upon his shoulder, but her hand encountered vacancy, and she retired in alarm. As she was about to leave the room, however, she looked back and still saw the figure occupying the same position in the chair. After recovering from the first effects of her alarm, Miss N. determined to enter the room again, and investigate into whether the appearance which she had witnessed might not be caused by a peculiar arrangement of drapery or something lying upon the chair. The same appearance, however, presented itself as before, and which she now became convinced was some spectral illusion. In this belief she looked at it from various sides and corners of the room, rubbed her eyes, and changed her position in various ways, and it still appeared in the same attitude. She also left the room and came back again, but still the apparition was there.

Fully half-an-hour might elapse from the time that this lady first saw the apparition till it disappeared. She did not see it vanish, but it was still present when she entered the room three or four times, but on the fourth or fifth it was gone. The old gentleman was in good health at the time, and had been at church

with the rest of the family, from which they all returned at the proper time, the storm having by that time passed over.

3. The subject of case third is a professional gentleman of high literary attainments. His narrative of the illusions is before me, and I shall nearly give them in his own words. It is necessary to premise, however, that he is an individual of a sanguineo-nervous temperament, and possesses a very powerful imagination. I have never been present at the time of his seeing any of the illusions which I am about to relate; but on several occasions have attended on him professionally. On one of them he had a pretty smart attack of scarlatina, which was succeeded, at no great interval, by a very severe attack of typhus fever. During both of these diseases the excitement of his mind was great and the phantoms of his imagination so numerous, so varied, and so vivid, as to surpass any thing that I had previously seen, or since witnessed.

Before detailing the particular illusions of this gentleman, it seems of consequence to premise a peculiarity of vision to which he is subject, and which consists in the power of the retina continuing impressions, and probably also of the mind to recall them. Thus he has often repeated the well known experiment which we have mentioned, of looking at a window at some distance from the eye, and then transferring the eye quickly to the wall. He has never been able, however, to see the change of colour which Dr Brewster describes as taking place when the object itself is succeeded by the spectral impression of it.

Mr H., too, has frequently seen, on looking at a line of lamps on a street, and then suddenly turning his eyes to a dark cloud, the line of lights continuing for a considerable time there. On one occasion, says he, "when looking at the front of the Royal Institution, by gas light, and suddenly turning to the sky, I beheld the pillars almost as distinct as when I saw the real object." These two instances may be referred to the well-known power of retaining impressions. In the following instance, however, the impression must be considered as recalled to the retina by some unconscious mental power. When walking with a friend one evening by moonlight, Mr H. happened to look up and beheld the vane of a signal staff, having a large crown on it, exactly on the lunar surface. So forcible was the impression that he directed the attention of his friend to it, and continued looking at it for a few minutes. They then proceeded onwards, and had passed a large building before they again saw the moon, when to the sight of Mr H. the image of the crown and vane still presented itself on the surface of the moon, as distinct as the real object a few minutes before. These phenomena do not occur to Mr H. at all times, but he has always the power, when looking at a window,

and then turning his eyes to the wall, of seeing the window again on the wall.

The first distinct spectral illusion of which Mr H. became conscious, occurred in the autumn of the year 1838. He was lying on a sofa reading, being in his usual good health at the time, and that the subject could have had no influence in exciting such ideas, it may be mentioned, that the work in the course of perusal was De Comines' History of the House of Burgundy. On looking towards the window, through which the rays of light were entering and falling brightly on a chair placed near it, he saw a skull, and of course conceiving it to be a reality, was on the point of ringing the bell to inquire why it had been brought into that room, thinking it was one belonging to himself, which had been placed there by some of the family. He, however, rose and walking to the chair, was on the point of placing his hands upon it to lift it, when it disappeared. Mr H. felt so startled by this circumstance that he nearly fell on the floor, and a slight giddiness continued during the remainder of the afternoon.

2d, About a fortnight after the occurrence just related, and about the beginning of November 1838, Mr H., when sitting in the Rhetoric class-room of the Edinburgh University, conversing with a friend before lecture, turned his eyes suddenly towards the window, and then on the desk, which extends along the room, and on which the light was falling at the time, he again beheld the skull. So convinced was he of the reality of the appearance that he immediately said to his friend, "I wonder what the Professor is going to do with a skull to day." Doubtless very much to his friend's astonishment.

3d, After reflecting on these cases, it occurred to Mr H., that he had for months before seen people on the road coming towards him, and often wondered where they had so suddenly gone to. He had at the time no idea that they were illusions, but a very few days' experience satisfied him of their true nature.

4th, One evening towards dusk, whilst sitting in the garden, Mr H. rose suddenly and experienced a slight giddiness, which he was in the habit of feeling occasionally when rising quickly to the erect posture. As the giddiness went off, he beheld the figure of a man, with a large blue cloak thrown around him, and standing under a tree at a short distance, the figure, in the course of a minute or two (during which Mr H. stood still gazing at it) gradually became more faint in outline and colour, and disappeared. About half an hour afterwards, on going from the house again into the garden, under the same tree, and in the same spot, Mr H. beheld the same figure. It occurred to him that it was an excellent opportunity for trying Dr Brewster's test of deciding between illu-

sions and realities, he therefore pressed the one eyeball, without producing any other effect than simply rendering the figure less distinct, but on squinting he distinctly saw the figure doubled to as great an extent as a real object, by the same process. Mr H. immediately walked towards the figure, which gradually receded, and disappeared as soon as it cleared the shadow of the tree.

5th. I shall relate this in Mr H. own words. "During my attendance at school I was in frequent intercourse with a boy, whom I shall call D——, he was, in short, my intimate acquaintance in boyhood for many years, until, by the continued dissipation of an infatuated father, the circumstances of the family began to decline, and, step by step, they became reduced to the greatest wretchedness. In the course of a few years D—— was sent to sea, as the speediest method of getting rid of him. I consequently lost sight of him for many years, until at length I heard that he had returned to his wretched home, labouring under symptoms of advanced consumption. He was attended, during his illness, by Dr C., and three months after his return home he died. I was requested to attend the inspection of the body, and it will readily be believed that many reflections of a sad and painful nature occurred to me, producing an impression on my mind which several years failed to dissipate. This occurred in 1835, and three years afterwards the circumstances of the family having continued the same, their unhappy case was again recalled to me in the following singular manner:—One evening at the time when I was daily in the habit of seeing spectral illusions, I was engaged in reading Tytler's *Life of the Admirable Chrichton* for a considerable time after the rest of the family had retired for the night, and after I had finished my book, and was on the point of proceeding to my bed-room, I saw a letter lying on a side-table, which proved to be an invitation to attend the funeral of D.'s mother. This was the first intimation I had had of her death; and many painful circumstances connected with her unhappy life, which need not be mentioned here, immediately occurred to me. I proceeded to my bed-room, reflecting on these circumstances, undressed myself, and had extinguished the candle, when I felt my left arm suddenly grasped a little below the shoulder, and forcibly pressed to my side; I struggled to free myself for a time, calling aloud 'let go my arm,' when I distinctly heard the words 'don't be afraid,' uttered in a low tone. I immediately said, 'allow me to light the candle,' when I felt my arm released, and I then proceeded to another part of the room for means to light the candle, never for a moment doubting but that some one was in the room. I at the same time felt an uneasy giddiness and faintness, which almost overpowered me. I succeeded, however, in lighting the candle, and, turning towards the door, I beheld the

figure of the deceased D—— standing before me. It was dim and indistinct, as if a haze had been between us, but at the same time perfectly defined. By an impulse I cannot account for, I stepped towards it with the candle in my hand; it immediately receded at the same rate as I advanced, and, proceeding thus with the face always towards me, it passed through the door slowly down stairs till we came to the lobby, when it stood still. I passed close to it and opened the street door, but at this moment I became so giddy that I sank down on one of the chairs, and let fall the candle. I cannot say how long I remained in this situation, but on recovering I felt a violent pain over my eyebrows, with considerable sickness and indistinctness of vision. I passed a feverish and restless night, and continued in an uneasy state during the following day. I may mention that the figure was at times more distinct than at others, but always dim and imperfect. I was always able to distinguish the different colours of the clothes, and I had never seen the individual during life dressed in a similar way. In all its characters it approximated the illusions of fever more than any other which I have witnessed, and I never for a moment could have considered it a real object. It is difficult in this instance to find any other exciting cause except the pain felt in my arm, which I can now refer to cramp of the triceps muscle acting on the peculiar state of mind incident to spectral illusions, together with a powerful imagination, already greatly excited by the peculiar circumstances of the case. I may state that I have felt the same feeling in the arm since, without associating it with any similar consequences."

In connection with this gentleman's illusions, it is proper to state that another member of the family has been affected with that peculiarity of vision, by which only one-half of the object is seen at a time, such as one-half of a figure on the street, or, as in the case of Wollaston, one-half of the name on a door or sign-board. Immediately succeeding the occasions on which these phenomena occurred, the lady was always affected with violent head-ach, and frequently with severe epistaxis.

It was Mr H.'s intention to have detailed to the world the numerous instances on which these phenomena have occurred to him; "but," says he, "when I reflected on the subject, I always found the illusions increased to such an extent, that they became occasionally truly alarming." Indeed, it was with difficulty that I could persuade him to write out for me short notes of the appearances, and this at a considerable interval of time after they had ceased entirely, lest they should again return.

CASE 4.—A gentleman in the south country, in the prime of life, and in perfect good health, was paying a visit one evening towards dusk to a neighbouring friend. After shutting the avenue

gate, and as he was about to proceed up the avenue, the figure of a female dressed in black glided past immediately before him. Soon after another figure, precisely similar in appearance and dress to the former, followed. Thinking that this might be some trick which the females of the house were about to play upon him, he stretched out his hand to grasp the third as she made her appearance, but, lo ! there was nothing there, and, upon looking after the figure, it had vanished. Shortly afterwards, in crossing through one of the parks in the neighbourhood of the house, he fancied he saw several asses grazing, and he was about to lay his hand upon the back of one of them and stroke it down, when, to his dismay, his hand encountered nothing. They still, however, appeared for a time before him, and he tried the experiment of touching them with his hand several times.

It is probable that this gentleman (who is still alive and well) had been much exhausted by fatigue at the time when this illusion occurred to him, as it more resembles some of the apparitions of the early stage of *delirium tremens* than any that has been previously recorded.

CASE 5.—I have been favoured, through the kindness of Dr Dunsmure, with the history of an interesting spectral illusion which occurred to a medical gentleman, a friend of his, and which is detailed below in the gentleman's own words.

"Some four or five years since, a middle-aged respectably dressed man, a stranger in Edinburgh, expired suddenly in a public omnibus, when passing along the North Bridge. The body was placed in the police-office till claimed by the friends. Next day I received from the authorities the usual warrant to make an examination, and report as to the cause of death. (Rupture of an aneurism into the pericardium.)

"On entering the apartment where the body lay, clad as when in life, and attired as for a journey, I was informed of the affecting incident narrated above, and I naturally felt deeply interested by a calamity in itself so appalling, and probably most painfully eventful to others. This feeling was, moreover, greatly heightened at the time on observing more closely the features of the dead man. The countenance was remarkably open and intellectual, and its general expression pleasingly striking and attractive, even to an extreme. The impression on my mind, however, gradually wore off, and was in a manner forgotten, when unexpectedly recalled at a distant period in the following manner:

"I had been employed for a few days in writing on a professional subject, and it so happened, that, of a forenoon when thus engaged, on raising my eyes from the paper, the vision of the dead stranger stood before me, with a distinctness of outline as perfect as when I first saw him extended on a board. His very apparel

was identical, only that the broad-brimmed hat, which was formerly by his side, now covered his head ; his eyes were directed towards me ; the peculiar benignity of expression, which before struck me so much, now beamed from his countenance. In a few minutes he disappeared.

"I may remark, however, that, when the image was quite distinct, I could, after an effort of the eye, discover through its person a print of Caractacus hanging on the opposite wall."

The gentleman who witnessed the above described illusion has had various personal experiences in connection with the subject. He is at present in good health, and was in perfect health at the time that the above illusion occurred to him.

The illusion we have just described is of a most interesting description, not only as regards the state of health in which the individual was in at the time, but also as regards the illusion itself. It was simply a recalled impression, and, therefore, ought to have been placed first in the list of cases recorded in the present paper. The mind of Dr — had been deeply impressed at the time of the occurrence, and more especially with the peculiarity of dress and benignant aspect of countenance of the deceased. The circumstance connected with it had almost passed from his memory, until, after close mental application for some days on a professional subject, it is probable that a train of ideas, of which he might not at the time be aware, brought again to his recollection the form and aspect of the individual in whose fate he had felt such a deep interest ; and, as when an individual, with a striking object before him, turns his attention upon some distant one, the recollected image of the latter, for a moment, excludes the perception of the former ; so with Dr — the image of the deceased was portrayed before him with great accuracy of outline ; nevertheless, and nothing daunted, he tried the experiment of looking at objects through the image, and distinctly saw a plate of Caractacus, which he knew to be hanging on the wall, as it were through the spectre. Thus was his experiment very similar to the one we mentioned above.

The close mental application combined with a constrained position at the time, or probably some derangement of stomach, of which he might not be aware, was the cause of that pathological condition of the brain or membranes which had given rise to the illusion.

The last illusion which I have recorded of Mr H.'s appears to me one of the most singular which has been described, or of which I am aware. In cases first, second, fourth, and fifth, as well as in the majority of those on record, sight alone was the sense affected. In Mr H.'s case, however, both his vision, hearing, and touch were equally brought into error. It must have been truly alarming when his three senses were thus deceived, and we cannot wonder that he

was overcome with horror towards the termination of the illusion.*

Nicolai heard the phantoms of his imagination talk to him, and some of them even addressed him at considerable length. Mrs A., too, whose case Dr Brewster has related, frequently heard what she conceived to be the voice of her husband calling to her by name.

This illusion is so interesting, and so distinctly told, that I am induced to relate it here. "On the 26th December 1830, about half-past four in the afternoon, Mrs A. was standing near the fire in the hall, and on the point of going up stairs to dress, when she heard, as she supposed, her husband's voice calling her by name, '—— come here ! come to me !' She imagined that he was calling at the door to have it opened ; but upon going there and opening the door, she was surprised to find no person there. Upon returning to the fire, she again heard the same voice calling out very distinctly and loudly—'—— come, come here !' She then opened two other doors of the same room, and upon seeing no person she returned to the fire-place. After a few moments she heard the same voice still calling—'—— come to me, come ! come away !' in a loud, plaintive, and somewhat impatient tone. She answered as loudly 'Where are you ?' 'I don't know where you are ;' still imagining that he was somewhere in search of her ; but, receiving no answer, she shortly went up stairs."

On Mr A.'s return to the house about half-an-hour afterwards, she inquired why he called to her so often, and where he was, and she was of course greatly surprised to learn that he was not near the house at the time. Individuals, also, who are not liable to see spectral illusions, or to have illusions of any other sense, are not unfrequently deceived by aural ones. Thus, Dr Johnson retained a deep impression, that, while opening the door of his college chambers, he heard the voice of his mother, then at many miles distance, call him by his name ; and such are not to be wondered at, when we consider that when the imagination is bent upon any particular train of thought, how very soon the slightest accidental sound is fitted to the subject, and at once becomes the origin of an illusion.

It is to such forms of aural illusions that Sir Walter Scott and others have traced many superstitious beliefs,—such as the visionary summons which the natives of the Hebrides acknowledge as a sure sign of approaching fate, in the phantom voice of some absent, or probably some deceased friend, repeating the parties' name. "It is scarce necessary to add," says Sir Walter "that the highly imaginative superstition of the wild Huntsman of Ger-

* Mr H. remarks, "I cannot say I was overcome with horror, as I never conceived the object real ; but I attribute the giddiness and sickness to a part of the physical indisposition which gave rise to the spectres."

many seems to have had its origin in story fancy, operating upon the auricular deceptions respecting the numerous sounds likely to occur in the dark recesses of pathless forests."

" There oft is heard at midnight or at noon,
Beginning faint but rising still more loud,
And louder, voice of hunters and of hounds,
And horns, hoarse-winded, blowing far and keen.
Forthwith the hubbub multiplies, the air,
Labours with louder shouts and rifer din,
Of close pursuit, the broken cry of deer
Mangled by throttling dogs, the shouts of men,
And hoofs thick beating on the hollow hill.

" The airy tongues that syllable men's names,
On shores, in desert sands, and wildernesses.'—*Comus*.

To return, however, to Mr H.'s case, it will be remembered that his sense of touch was also deceived. This is one of the rarest forms of illusion. " I felt," says Mr H., " my left arm suddenly grasped a little below the shoulder, and forcibly pressed to my side. I struggled to free myself for some time, calling aloud, " let go my arm." The only other case which I have been able to find on record where the sense of touch was affected, occurs among the visions of Beaumont, and is related by Dr Ferriar. " I have been sitting by the fire with others," says he, " and seen several spirits, and pointed to the place where they were telling the company they were there, and one spirit, whom I heard calling to me as he stood behind me, on a sudden clapped his finger to my side, which I sensibly perceived, and started at." It will be remembered that Mr H. distinctly referred the feeling which he has above described to cramp of the triceps muscle (a feeling which he was in the habit of experiencing afterwards) acting upon the peculiar state of mind incidental to spectral illusions, together with a powerful imagination already greatly excited by the peculiar circumstance of the case.

And here I may mention that Mr H. is convinced (and I am strongly inclined to agree with him in the conviction) that when the mind is wrought up to the peculiar state fit for such illusions, an accidental circumstance like that mentioned, or an unusual sound, or, as in the case of the eye, a peculiar arrangement of light, and shade, or drapery, gives rise to a train of imagining which takes upon itself the semblance of reality. In this way the origin of many curious cases which have been recorded is distinctly to be traced to some unusual disposition of light and shade, drapery, &c. Thus, Sir Walter Scott, whose mind was excited at the time with having just read an account of the death and opinions of his friend, and illustrious fellow poet, Byron, on going into the hall, saw before him the image of his departed friend; he stopped for a single moment, so as to notice the wonderful accuracy with which fancy had impressed upon the bodily eye the peculiarities

of dress and posture of the illustrious poet, and, stepping forward to it, beheld that the whole resolved itself into the peculiar arrangement of drapery hanging upon a screen in the hall. I am inclined to think that the fourth illusion of Mr H.'s, which I have related, owed its origin to some particular arrangement of light and shade. It is probable, too, that in the vision of Beaumont, which I have quoted, the voices of the spirits which he heard behind him arose from the (probably modified) voice of some of his friends in the room, and was the origin of his fancying himself in the presence of some malignant spirit, at the time when some slight pain occurring in his side, was immediately construed by him, into a touch from the finger of his malignant spirit, suiting the train of his imagination at the time.

Mr H. is far from being a timid or superstitious individual. The majority of his spectral illusions, indeed, he witnessed with indifference, and we cannot wonder at his being horror-struck at the others. In his first illusion which I have related, it will be remembered that he thought of; and put to trial the test which Dr Brewster has proposed for distinguishing between real objects and illusions, viz. by pressing against the eyeball, or straining them both, as in squinting. For in the case of an external object, it would invariably be doubled, while the impression on the retina created by the mind would be single.

It will be remembered that Mr H., when he tried this experiment, found that the illusion was distinctly doubled. This experiment having never been previously tried by any of those individuals whose cases have been recorded, it becomes interesting to explain, how Mr H. should have seen those images of the mind doubled, which from the soundest reasoning, and the strictest optical principles, we have been led to the inference, (we would say almost the natural conclusion), that it ought to have been single. This circumstance is explained by Mr H., on the ground that "the mind, possessing the impression primarily on itself, refers it to its natural locality, the retina, and by its own conclusion, imperceptible to ourselves,—deceives itself, showing a double action to exist at the same instant of time."

I am inclined, however, to explain the result of this experiment of Mr H.'s in a different way. It appears to me that no one can read the fourth illusion of this gentleman's without being convinced that the effects of light and shade had their own influence in giving rise to the illusion. If a certain arrangement of drapery, or a strong light thrown upon an object, and giving rise to a corresponding depth of shade, gives rise (in a mind incidental to them) to a spectral illusion, this cannot be said to be an illusion having its origin in the mind; for although the peculiar state of the mind at the time is the cause of its assuming its particular shape,

yet the retina has a certain material object impressed upon it, which, on squinting or straining the eyes, would be as liable to be doubled as any other external object. Had Sir W. Scott,* when he saw the image of his deceased friend, and so distinctly traced it to a certain arrangement of shawls, &c. on a screen in the lobby; had he, we remark, tried the experiment of Dr Brewster, and strained his eyes, or pressed the eye-ball, we have no doubt, but that he would have seen the image doubled, in the same way as an external object.

Pathology.—Little has been left for us to say (at least as far as our present information extends) beyond the labours of Drs Hibbert† and Craigie‡ in this field.

The work of Dr Hibbert is found to contain much matter on the particular morbid affections with which the production of phantoms is connected. He finds them to be connected with a plethoric state of the constitution, to be frequently seen as a hectic symptom, to be the frequent concomitant of febrile and inflammatory affections, as well as arising from excitement with certain gases, from hysteria, hypochondriasis, epilepsy, nervous irritability, and inflammation of the brain.

Dr Craigie, who, to a sound and unbiassed judgment, has added much erudition in the examination of the pathological condition of these phenomena, sums up his experience in the following words: Spectral images are seen chiefly in three states of the system; 1st, Either when the stomach is disordered, or digestion has been more or less deranged; 2d, When there is a congestive or irritative state of the cerebral membranes; and 3d, When both states are combined.

We may say that we entirely agree with Dr Craigie in these deductions. It appears to us, however, that probably the most frequent cause of these phenomena, unconnected with an actually diseased state of the brain or its membranes, consists in a want of balance between the circulation in the brain and envelopes, and the other parts of the system. That, again, may be consequent upon disorder of the digestive functions; but certainly the immediately exciting cause seems to be the want of balance just mentioned. In the cases we have just related, the first was much reduced by blood-letting and other antiphlogistic treatment, for various affections under which he had laboured.

The subject of case second had laboured under an attack of slight fever, from which she was just convalescent; while Mr H., the subject of case third, was in his usual good health at the time,

* Letters on Demonology and Witchcraft, by Sir Walter Scott, p. 39.

† Sketches of the Philosophy of Apparitions, by Samuel Hibbert, M. D., F. R. S. E.

‡ Dr Craigie in the Edinburgh Medical and Surgical Journal, No. 129.

with the exception of slight giddiness, which was liable to occur in changing from the recumbent to the erect posture. This sudden change of position would of course destroy the balance of the circulation, which had been going on in the recumbent posture. If we glance for a moment at many of the most interesting cases which have been recorded, we shall find that they are chiefly to be referred to this loss of balance, either from the sudden abstraction of a large quantity of blood, or from a plethoric condition of the system. Of the former class, (those induced by extreme weakness, from great loss of blood,) two interesting cases have been recorded by Dr Craigie.

"Thus," says he, "I once witnessed a very distressing case of spectral illusion ensuing on great loss of blood employed to check profuse hæmoptysis, and which lasted at intervals for several days. Upon another occasion, a young married female of 25, who had lost more than forty ounces of blood at one blood-letting, in order to check a smart attack of puerperal peritonitis, had a very decided attack of spectral delirium, which was only removed by the use of a large dose of laudanum, and the application of cold to the head." "In these cases it may be irritative or passive congestion," says he, "but it cannot be inflammation which is the cause of the illusions."

I may also, in illustration, mention the case of a very robust man whom I saw some years ago, and who was very largely depleted for an attack of pneumonia; and I well remember in his half-waking, half-slumbering state, what a train of beautiful vision he witnessed, in the shape of long processions passing through his chamber, with much gilded equipage and the like, which, to his fancy, were the greatest visions of earthly splendour he had ever witnessed, but which all disappeared in a press in the wall at the foot of his bed.

As illustrative of a plethoric state of the constitution inducing these images, we may mention the well-known case of Nicolai, the German bookseller and philosopher. Some years previous to the occurrence of his illusions he was in the habit of regularly applying leeches twice or thrice a-year to prevent congestion in the head, which was liable to occur to him from severe study and sedentary habits, and which was ushered in by violent giddiness. On the occurrence of these phantoms, besides having been exposed to much mental annoyance, he had also neglected this periodic evacuation; and although he had recourse to several medicines, yet his disorder, viz. the phantoms, sensibly increased, until he was at last obliged again to have recourse to the application of leeches. "This," says he, "was performed on the 20th of April at eleven in the forenoon. I was alone with the surgeon, but during the operation the room swarmed with human forms of every description, which crowded fast one on another.

This continued till half-past four o'clock, exactly the time when the digestion commences. I then observed that the figures began to move more slowly; soon afterwards the colours became gradually paler, to move more slowly, become gradually less distinct, then white, and finally disappeared about eight o'clock of the same evening." We shall find a great similarity in the above description and that given by Mr H., when leeches were applied to relieve the congestion in his head during scarlet fever. "When leeches were applied to the head," says he, "during the gradual bleeding, what appeared to be a confused dream slowly resolved itself into figures possessing all the intensity of actual impressions; and, again, as the bleeding continued, becoming clearly identified with the figured curtains of the bed."

Dr Craigie* has translated an excellent case in point from Hufeland's Journal, (6th volume.) An intelligent person was sitting one evening in his chamber in the apparent full enjoyment of corporeal and mental health, when the door seemed to be suddenly opened, and a person, whom he knew to be a friend, entered, walked into the middle of the room, and standing before him, stared on him firmly. The gentleman rose to meet his visitor, but when he approached the form of his friend vanished, and he then knew that it was a phantom. Soon after, however, the figure returned, and with it those of several other persons known to the gentleman, all of whom in the same manner stared at him and flocked around him. This phantom assembly, in the course of a quarter of an hour, increased with the addition of some figures which the individual had not before seen, to such an extent, that the apartment could scarcely contain them. When he retired to his bed-chamber he was equally followed by them; they flocked round his bed, and it was with difficulty that he procured a few hours of sleep. Upon waking, no long time elapsed before they returned one by one till the whole assembly were as numerous and persevering as the previous day. As the visitation was continued on the following day he consulted his medical adviser on the subject. It was discovered that, about twelve months previously, at that very time, he had lost blood for symptoms of congestion in the head, and not unfrequently he had felt hemorrhoidal efforts. The application of leeches was had recourse to. Next morning the assemblage of phantoms were already less numerous and tumultuous, and towards noon it underwent a still greater diminution. In the afternoon only two figures were present, and in the evening the patient recognized only one, which gradually became more indistinct, and at length entirely vanished.

An interesting case of a similar kind occurred to the late Dr Gregory. His patient, an individual of rank, was in the habit of seeing, at a certain hour after dinner, the form of a hideous hag enter the room with a most malignant aspect, and strike him a se-

* Op. citata, No. 129.

were blow with her staff. The Doctor dined with him one day, and tried by animated conversation to draw away the time beyond that at which the visitor generally made her appearance. The clock had scarcely struck the usual hour, however, when the gentleman exclaimed in an alarmed voice, "the hag comes again," and immediately dropped away in a swoon. The physician caused him to be bled, and satisfied himself that the periodical shocks of which his patient complained, arose from a tendency to apoplexy. Such cases we think sufficient to illustrate the point, of the very frequent connection of illusions with an unduly balanced state of the circulation.

In cases 1. and 2. which I have recorded, the digestive functions were still faulty at the time. Some, therefore, may be rather inclined to attribute the phantoms to this source than to the one to which we have referred it, viz. a weak state of the cerebral circulation.

Concluding Remarks.—We have already pointed out the manner in which individuals of sound mind and in good bodily health see spectral appearances; how these are to be explained and accounted for, and how little is the change from the simple retention of a bright image upon the retina to those apparitions which are often so alarming as to strike terror to the strongest mind. We propose here shortly to illustrate the connection which is to be observed between the different states in which these dreams or illusions take place, and to point out the gradual transition which is to be noticed between simple dreaming and the ravings of insanity. They indeed would seem to be all links of a grand chain which are closely and indissolubly connected together, and are as beautiful in gradations from beginning to end as they are fertile in affording ground for the explanation of the phenomena. We propose to divide the whole phenomena of illusions into two heads. First, *the Dreams of Sleep*, and second, *the Illusions of the Senses, or Waking Dreams*. These comprehend, as we said before, and we hope to show as we proceed, all the illusions which occur, from that of a trifling dream during sleep to the ravings of insanity. First, then, *Dreams of Sleep*.

"The peculiar condition of the mind during dreaming," says Dr Abercrombie, "appears to be referable to two heads.

"a. The impressions which arise in the mind are believed to have a real and present existence; and this belief is not corrected, as in the waking state, by comparing the conceptions with the things of the external world.

"b. The ideas or images in the mind follow one another according to associations over which we have no control; we cannot, as in the waking state, vary the series, or stop it at our will."

Such appears to us to be a correct account of the state of mind in dreaming, and the only difference which we conceive to exist

between this state of the mind during sleep, as Dr Abercrombie has described it, and the waking dreams, consists that, in those illusions unconnected with disease, we have the power of controlling the train of thought, and comparing them with external objects. For example, an individual under the influence of some strong mental emotion falls asleep for a few moments without being sensible of it ; he dreams of some object or individual connected with his former impressions, and starts suddenly up, believing it to be a spectral illusion. He had not the power of controlling his train of thought, and it occurring with great rapidity, he fancied it had lasted for a considerable time.

In a spectral or other illusion of the senses occurring during the waking hours, and unconnected with bodily disease, an individual has so far the power of controlling the train of thought, as, by an effort to change it, to compare it with external objects, or to try other means to put a stop to the illusion. In disease, again, the reasoning powers are equally at fault, and there can be no room for the correction of false impressions. We propose, then, to distinguish dreams from illusions, in that, while in the former the impressions of the mind are supposed to have a real or present existence, in the latter the mind has the power of controlling the train of thought, or of correcting it by the other senses, or by a comparison with external objects.

Such being the definition of a dream as distinguished from an illusion, we propose now to show the different stages in which the latter are to be traced. "I have frequently," remarks Dr Ferriar, "conversed with persons who imagined that they saw demons and heard them speak, which species of delusion admits of many gradations and distinctions, exclusive of actual insanity."—"Of dreams," said the Antiquary, "why, what should I think of them, but as the deceptions of imagination when reason drops the reins? I know no difference betwixt them and the hallucinations of madness,—the unguided horses run away with the carriage in both cases, only in the one the coachman is drunk, and in the other he slumbers."—(See Antiquary, Vol. i. p. 189.)

a. An *illusion* or *waking dream*, in its simplest form, includes those images arising from the workings of the mind, which are portrayed before the individual, to the temporary exclusion of external objects. Every one is familiar with the common-place phrases of a brown study, day-dream, &c. These, however, in their perfect degree are nothing else than instances of illusions, as we have just described them. We have already referred to an experiment which may satisfy any one that this power is possessed to a certain extent by all. In standing before a large building, and without changing our position, call to recollection some well-known distant object, such as the view of Mount Blanc from Chamounix, the recollected image for a time excludes the perception of the real one. Instances of this power in a more remarkable degree

have been detailed. Thus Dr Conolly mentions the case of a gentleman, who, when in great danger of being wrecked in a boat on the Eddystone Rocks, said he actually saw his family at the moment. "In similar circumstances," says Dr Abercrombie, "of extreme and immediate danger, others have described the history of their past lives being represented to them in such a vivid manner, that, at a single glance, the whole was before them, without the power of banishing the impression." To such, too, is most probably to be referred the case related in the *Christian Observer* for October 1829, and also quoted by Dr Abercrombie. "A gentleman lost his wife under most painful circumstances, shortly after the confinement of her first child. A few weeks after this melancholy event, while travelling during the night on horseback, and in all probability thinking over his sorrows, the form of his lost relative appeared to be presented to him at a little distance in advance; he stopped his horse, and contemplated the vision with great trepidation, till in a few seconds it vanished away. Within a few days of this appearance, while he was sitting in his solitary parlour late at night, reading by the light of a shaded taper, the door, he thought, opened, and the form of his deceased partner entered, assured him of her complete happiness, and enjoined him to follow her footsteps," &c. This second appearance, we are inclined to think with Dr Abercrombie, was most probably a dream.

b. In the next stage of illusions, the mind intent upon a subject, person, or particular train of thought, arranges an object with the assistance of drapery, or the effect of light and corresponding shade, into an image of the subject or person that the mind is primarily occupied with, and the drapery or light and shade so assist the excited state of the imagination as to give rise to the image of persons or objects. We have already related the case of Sir Walter Scott, when he saw the image of Lord Byron. Another very distinct one we shall shortly relate in the words of Dr Ferriar of Manchester, to whom the gentleman mentioned the circumstance. "He was benighted while travelling alone in a remote part of the Highlands of Scotland, and was compelled to ask shelter for the night at a small lonely hut. When he was to be conducted to his bed-room, the landlady observed, with mysterious reluctance that he would find the window very insecure. On examination, part of the wall appeared to have been broken down to enlarge the opening. After some inquiry, he was told, that a pedlar, who had lodged in the room a short time before, had committed suicide, and was found hanging behind the door in the morning.

"According to the superstitions of the country, it was deemed improper to remove the body through the door of the house; and to convey it through the window was impossible without removing part of the wall. Some hints were dropped that the room had been subsequently haunted by the poor man's spirit."

"My friend laid his arms, properly prepared against intrusion of any kind, by the bed-side, and retired to rest, not without some degree of apprehension. He was visited, in a dream, by a frightful apparition, and awaking in agony, found himself sitting up in bed with a pistol grasped in his right hand. On casting a fearful glance round the room, he discovered by the moonlight a corpse dressed in a shroud, reared erect against the wall close by the window. With much difficulty he summoned up resolution to approach the dismal object, the features of which, and the minutest parts of its funeral apparel, he perceived distinctly. He passed one hand over it; felt nothing, and staggered back to the bed. After a long interval and much reasoning with himself, he renewed his investigation, and at length discovered, that the object of his terrors was produced by the moon-beams, forming a long bright image through the broken window, on which his fancy, impressed by his dream, had pictured with mischievous accuracy, the lineaments of a body prepared for interment." It will occur to the recollection of most, the use which Sir W. Scott has made of this power, in no very exaggerated form, to produce Lovel's vision in the haunted green chamber at Monkbarrow.* We have already detailed the case of Mr H., who, in his fourth illusion, saw the image of a man with a blue cloak, under the shadow of the tree. The effects of light and shade had doubtless the principal influence in producing this illusion.

But this power cannot be better traced than in the following example. "At one part of the road," says Mr H. "where a lamp casts an irregular shade, I often beheld what appeared to be a dog, always passing from left to right. I stood several times and watched the exact spot where it appeared, and I found that it was invariably where the iron band of the lamp casts its shade over the road. This impression once made, may continue for any length of time; though the same distribution of light should exist no longer, and even though the mind be conscious of the illusion under which it labours."

c. Under this head we include as the next stage in which illusions are noticed, the many curious and sometimes alarming illusions of the eye and other senses which have been recorded in the works of Ferriar,† Hibbert,‡ Alderston,§ Sir W. Scott,|| Brewster,¶ Abercrombie,** &c., out of which two interesting cases have been detailed in the previous part of this paper. To these we would refer, as specimens of the stage in this chain of illusions.

* Antiquary.

† Ferriar's Theory of Apparitions, 1813.

‡ Hibbert on Apparitions, 1823 and 1825.

§ Alderston's Essay on Apparitions, 1823.

|| Sir W. Scott's Letters on Demonology and Witchcraft, 1830.

¶ Sir D. Brewster's Letters on Natural Magic, 1832.

** Dr Abercrombie on the Intellectual Powers, 1830.

d. In this stage we propose to place many of those curious illusions which are the offspring of some derangement of the cerebral circulation, previous to or during the occurrence of hysterical, hypochondriacal, epileptic, gouty, and other affections, not of a febrile nature. Of these a few of the most striking may be related as well calculated for the purpose of illustration.

The first one,* as an instance of a hysterical affection of the kind, is full of interest, not only as regards the phenomena themselves, but as regards the symptoms which accompanied them. A servant girl, 16 years of age, and subject to fits of sleepiness, during which she was troubled with disturbed dreams. She talked aloud, sang, and uttered wild incoherent expressions during them. Indications of somnambulism followed. She would fall asleep, imagined herself an Episcopal clergyman, go through the ceremony of baptizing the children, and give an appropriate and extempore prayer.

These illusions, or wanderings, as she called them, would suddenly come on while dressing herself, walking with the children; or serving the dinner-table. These fits would last for an hour, and differed from a dream in being characterized by fewer inconsistencies. In some of these, she saw the images of individuals and objects when her eyelids were closed, and also, once or twice in the same state, fancied that she saw mice running through the room, and that she was accompanied with a little black dog. About a quarter of an hour previous to each state of this kind, she felt somewhat drowsy; a pain in the head, usually slight, but which on one occasion was very intense, succeeded; afterwards a cloudiness or mistiness came over her eyes, and then ringing in the ears, and giddiness. On several occasions during the fit, being desired to tell what she felt, she put her hand to her forehead, and complained of her head. This case was accompanied with all the usual symptoms of hysteria.

"Dr Gregory used to mention in his lectures," says Dr Abercrombie, "the case of a gentleman liable to epileptic fits, in whom the paroxysm was generally preceded by the appearance of an old woman in a red cloak, who seemed to come up to him and strike him on the head with her crutch; at that instant, he fell down in the fit." "It is probable that in this case there was a sudden attack of headach connected with the accession of the paroxysm, and that this led to the vision in the same manner as bodily feelings give rise to dreams."

The next case, from Dr Alderston's † interesting work, illustrates well the illusions which are liable to occur in the state of the system connected with gout. "I was called to Mrs B., a fine

* Published by Dr Dewar in Transactions of Royal Society of Edinburgh, and copied by Dr Hibbert.

† On Apparitions, p. 28.

old lady about 80 years of age, whom I had frequently visited in fits of the gout.

She was seized with an unusual deafness, and with great distension of the organs of digestion, at a period when, from her general feelings, she expected a fit of the gout. From this time, she was visited by the phantoms of some of her friends whom she had not invited, and whom she at first so far considered as actually present, that she told them she was very sorry that she could not hear them speak, nor keep up the conversation with them; she would therefore order the card-table, and she rang the bell for that purpose. Upon the entrance of the servant, the whole party disappeared; she could not help expressing her surprise to her maid that they should all go away so abruptly; and could scarcely believe her, when she affirmed there had been nobody in the room. She was so ashamed, when convinced of the deception under which she laboured, that she suffered without complaining for many days and nights together, the intrusion of a variety of phantoms, and had some of her finest feelings wrought upon by the exhibition of friends long lost, who only came to cheat her fancy, and revive sensations that time had almost obliterated.” “ This complaint was entirely removed by cataplasms to the feet, and gentle purgatives; and terminated a short time afterwards in a slight fit of the gout.”

So much, then, for the illusions which are liable to occur in the affections we have just mentioned; illusions which are not connected with any morbid state of the cerebral substance or envelopes, but merely some temporary derangement of the circulation, or local plethora.

e. The next stage seems to be that of the illusions (more especially the early ones) of *Delirium Tremens*, and those from the use of opium.

We shall relate a few of the more uncommon and remarkable.

Mr —, keeper of a dram-shop, about a week or ten days previous to his having been seen by Dr Alderston,* after drawing some liquor in his cellar for a girl, he desired her to take away the oysters which lay upon the floor, and which he supposed she had dropped,—the girl thinking him drunk, laughed at him, and went out of the room; he endeavoured to take them up himself, but to his great astonishment could find none. On going out of the cellar at the door he met a soldier, whose look he did not like, attempting to enter. He desired to know what he wanted there, and upon receiving no answer, but, as he thought, a menacing look, he sprung forward to seize the intruder, and to his no small surprise found that it was a phantom. During the subsequent night he was haunted with a variety of spectres, some of dead,

* Alderston, p. 21, 2.

others of living friends and individuals. He even declared that he suffered severe bodily pain from the lashing of a waggoner with his whip, who came every night to a particular corner of his room, but who always disappeared when he jumped out of bed to retort. This individual led a hard life, till, by an accidental loss of blood of considerable extent, a long walking match against time, and a heavy drinking bout afterwards, he was thrown so much out of health, that he determined to abstain from it altogether, and it was after about a week's abstinence that the above phantoms appeared. He was cured by bleeding, leeches, and active purgatives. The next case is from the same author, but is related in the words of his patient. "I am oppressed by a complaint the most extraordinary I ever heard off; it only afflicted me this morning, and has occasionally shown itself during the day. My only complaint is that which accompanies a series of hard living; I can eat tolerably well, but I had a most violent bilious attack the latter end of last week, and vomited incessantly. This morning I awoke early after two very unusually sleepless nights, and to my surprise I saw horrid and ghastly spectres constantly present to my imagination. But to my greatest surprize, during a walk in my grounds about eleven o'clock, I fancied I saw a set of poachers on my estate coursing a hare, I followed on foot for several miles, they being present to my view all the time.

"As they were on horseback they eluded my pursuit. Having returned to my house, I again saw them a short time afterwards similarly occupied in the front of my house, and again pursued them for miles, until, on taking a larger fence, I suddenly lost sight of them, and I am now fully convinced that the whole was an illusion." This gentleman had received a fall from his horse, when tipsy, a few days before.

The effect of opium-eating is well known in giving an impression of reality to the visions of conception or imagination. In the Confessions of an English opium-eater, many curious instances of this kind are recorded. A remarkable one is related by Dr Abercrombie, as having occurred to the late Dr Gregory. 'He had gone to the north country by sea to visit a lady, a near relation, in whom he felt deeply interested, and who was in an advanced state of consumption. In returning from the visit he had taken a moderate dose of laudanum, with the view of preventing sea sickness, and was lying on a couch in the cabin, when the figure of the lady appeared before him in so distinct a manner that her actual presence could not have been more vivid.

He was quite awake, and fully sensible that it was a phantom produced by the opiate, along with his intense mental feeling, but he was unable by any mental effort to banish the vision.

f. Next in order come the illusions of fever and inflammatory

affections,—a most interesting class, as we shall show that they afford an explanation of the pathological state of the membranes of the brain, or brain itself, which equally apply to the explanation of other spectral phenomena. Fever is generally ushered in by a certain degree of listlessness and nocturnal restlessness. Soon the patient, worn out by watching, falls asleep for a short time, from which, however, he is speedily awakened by some horrid dream which has assumed all the force and vividness of an illusion, or reality itself. Very soon the effects of light and shade or drapery assist in forming to his excited imagination, figures which are at first with difficulty distinguished from realities, but soon become so constant as to appear realities, and to bear a part in all the other phantasmagoria which is going on around him, until they at last settle down into incoherent and constant delirium. Such may be stated to be the different mental states through which a patient in fever passes. Instances will occur to the mind of almost every practitioner, where peculiarities in the train of illusions above described have been witnessed. One of the most interesting cases we are aware of is from the pen of Dr Abercrombie. “A highly intelligent friend,” says he, “whom I attended some years ago in a mild but very protracted fever, without delirium, had frequent intercourse with a spectral visitor, who presented the appearance of an old and gray-headed man, of a most benignant aspect. His visits were always conducted in exactly the same manner; he entered the room by a door which was on the left hand side of the bed, passed the end of the bed, and then seated himself on a chair on the right hand side; he then fixed his eyes upon the patient with an expression of intense interest and pity, but never spoke, continued distinctly visible for some seconds, and then seemed to vanish into air.” I have already stated that I have had occasion to attend professionally upon Mr H., whose case (3d) I have related. This gentleman, when labouring under scarlatina, had an unusual degree of accompanying fever, with effused eyes, and great heat of head; his illusions came on early, and were singularly numerous. As part of the treatment to which Mr H. was subjected, a dozen of leeches was applied to his head. I shall describe the feelings which occurred to him afterwards in his own words, and I may state that he remembered all his illusions after he recovered. “A certain degree of excitation produces ideas or false impressions on the mind, referable, by its own conclusions, to the eye or other senses. Under this degree they cannot be distinguished from an ordinary dream; but beyond it becoming more and more indistinct and confused. Thus, in my own case of scarlatina, while leeches were applied to the head, during the gradual bleeding, what appeared to me a confused dream, slowly resolved itself into figures possessing all the intensity of actual impres-

sions ; and again, as the bleeding continued, becoming clearly identified with the figured curtains of the bed ; the same fact was observed, I believe, in the case of Nicolai, where it is said they faded to white, and then disappeared."

g. This head includes the illusions of insanity. It is a subject, however, of such vastness, that it will be quite impossible for me to enter into its consideration. It seems to form, however, the additional link in the train of phenomena we have been considering.

ART. VIII.—*Cases in Surgery*. By EDWIN ADOLPHUS, M.D.

Fellow of the Royal College of Surgeons of London, Extraordinary Member of the Royal Medical Society of Edinburgh, and Assistant Surgeon 98th Regiment.

1. *Case of Suppression of Purulent Discharge from the right Ear, very rapidly followed by extensive ulceration and abscess of the dura mater, involving the par vagum and auditory nerves, as also the substance of the pineal gland.*

IN Dr CRAIGIE'S Elements of General and Pathological Anatomy, I find some useful observations on that variety of cerebral abscess connected with purulent discharge from the ear, tending to refute the opinions of Bonetus and Brodie, the former of whom supposed the discharge from the ear to be consecutive to the affection of the brain, whilst the latter author seems inclined to think that the cerebral abscess is at least coeval with it. As the case which I am about to detail tends to corroborate the opinion, that the suppurative inflammation of the brain is the effect of the previous disease in the internal and tympanal cavity, you will oblige me by inserting it in the Edinburgh Medical and Surgical Journal.

William Clark, aged 19, private 98th Regiment, ten months in the service, by trade a gardener previous to enlistment, of a sanguine temperament, and of middle stature, was admitted into the Detachment Hospital of the 98th Regiment on the 27th May 1840.

It appears that, for the space of nearly one year and a-half previous to his entering the service, he had been affected with a discharge, sometimes watery, at other times bloody, and latterly, before his becoming a patient, purulent, from the right ear-hole.

This discharge, during the month of May, gradually diminished ; but this circumstance not attracting any attention on his part he continued performing his duty as usual, and on the 25th of the same month it had entirely ceased.

At the period of admission on the 27th May, he complained of pain in the upper part of the right temporal region, in which situation a small phlegmon was observed ; his pulse was quick and full, his skin hot and countenance anxious. Twenty ounces of blood were drawn from the arm ; five grains of calomel and one scruple of jalap were given ; and the patient was restricted to spare diet.

The same evening at 8 P. M. the phlegmon showed an erysipelatous tendency, and inflammation was extending above external canthus of right eye and over right supra-orbital region ; swelling greater and redness deeper, and does not disappear on pressure. He complained of shivering and of pain in the lumbar region attended with much nausea. Since the bleeding, he experienced some relief in the temple ; pulse 98, full ; the blood drawn was highly cupped, and buffy coat firm ; bowels freely opened. An emetic, consisting of one scruple of ipecacuan, with one grain of tartarized antimony, was given ; twelve ounces of blood were directed to be drawn from the right temple by cupping ; the sugar of lead and opium lotion was applied, and afterwards a blister.

28th. Emetic produced full vomiting, and blister had risen ; he passed a very restless night, having been at intervals affected with delirium, under which symptom he at present labours ; speaks incoherently, and his eyes present a vacant stare. Erysipelas has now approached near internal canthus of left eye ; swelling less, but pain considerable. He complained of violent pain in frontal region ; pulse 120, full and jarring ; bowels confined ; skin hot ; tongue covered with a yellow fur. The blood-letting was repeated to twenty ounces ; the head was shaved, and cold applied ; half-an ounce of the antimonial solution was given internally every third hour ; and one blue pill was ordered to be taken.

4 P. M. Had taken three doses of the tartar emetic solution, which had the effect of pacifying him, but he still is disposed to rave. Erysipelas has receded a little ; pulse slow and weak ; bowels open ; tongue clean ; skin perspirable. Remedies continued. Blood taken this morning much cupped.

At 9 P. M. he appeared more tranquil and sensible ; pain of head abated ; conversation rational ; erysipelas has been gradually receding since last report ; pulse 80, weak and small ; skin moist, and sweated much during the last three hours. The antimonial solution stopped ; ordered four grains of calomel and eight grains of extract of colocynth immediately.

29th. At 4 A. M. he was again affected with delirium in an aggravated form, and at present is raving. Bowels opened by medicine. Twelve ounces of blood ordered to be drawn from the nape of the neck, a blister applied to the scalp, and one pill of calomel and colocynth to be taken, and another at the end of three hours. The antimony resumed

2 P. M. About an hour ago he became drowsy, and has not taken any of the tartar emetic solution on that account. At present he is quite comatose, his respiration hurried and laborious; his pupils dilated; and he is occasionally affected with convulsions; pulse 60, very weak; refuses every thing offered to him. Blister has risen. Wine.

30th, Cannot be roused, and during last night continued in the same state; coma increasing; convulsive twitchings of the limbs frequently observed.

9 P. M. After continuing throughout the day in this comatose state, he died at the hour above stated.

Inspection of the body thirteen hours after death.—Body not emaciated.

Head.—On removing the scalp an abscess was found in the cellular tissue, occupying the situation where the *erysipelas phlegmonodes* was observable during life.

The substance of the brain was found to be preternaturally firm and resisting, resembling in consistence when cut into a portion of liver. The cerebellum was rather softer than natural, but presented nothing abnormal; neither did the *pia mater*, except greater vascularity than usual. The ventricles did not contain more fluid than natural.

On examining the *dura mater* there was observed a large irregular ulcer about the size of a crown-piece, whilst the *par vagum* and auditory nerves were seen implicated in it. The abscess extended through the *sella turcica*, and had disorganized the pineal gland.

The thoracic and abdominal viscera presented nothing peculiar.

From a detail of the preceding case it may be inferred that the abscess of the *dura mater* must have formed very rapidly, probably in a few days, and that it succeeded to the suppression of the ear-discharge. That it caused the ear-discharge is not probable; for how is it probable, that this lad, who had been doing his duty as a soldier, exposed to the exciting causes, could have laboured under inflammation, either subacute or even chronic of the *dura mater*, without the usual symptoms being evinced?

Indeed, he would have not been taken into hospital, had it not been on an account of an unseemly phlegmon which did not cause much pain at admission.

It is quite clear, that, owing to the discharge having been checked, the chronic external inflammation which had existed for so long a time, was, by metastasis, changed into an acute internal disease.

2. Case of Cervical Abscess, followed by hemorrhage from the inferior thyroid artery, terminating favourably.

John Boyle, Irishman, aged 40 years, 98th Regiment. April

3d. This man had been eighteen years in the service, twelve years of which were passed at the Cape of Good Hope, the remaining period on home service. Previous to enlisting, he was a blacksmith by trade, and states that he enjoyed good health ; but, on referring to the medical records of the regiment, it appears that he has been subject to several casualties whilst serving in the army. In 1829, he was under treatment for contusion from the 26th November till the 3d of December ; 1830, from 4th to 28th April, was affected with acute catarrh, and again in 1833 and 1836 ; 1834, contusion ; ulcers, (but not of penis,) otherwise it would have been stated in the admission and discharge book. Since his return from southern Africa, now a period of five years, he was in hospital only three times. All his complaints have been slight ; in none has mercury in any of its forms been exhibited ; nor do his present symptoms bear any connection with his previous maladies. At admission complains of much pain in the head ; pulse 100, full ; tongue furred ; skin hot and dry ; bowels confined. An emetic of one scruple of ipecacuan was ordered, and after its operation two pills of colocynth and calomel.

April 4th. The emetic given yesterday produced full vomiting, and the bowels were freely opened by the pills ; complains, however, of considerable frontal and supra-orbital headach this morning, and of some difficulty of swallowing. On examining the throat, the tonsils are observed swollen and inflamed. Mercurial fetor is recognized in smelling his breath ; and on inspection of the *glans penis*, a crop of warts in an irritable condition is observed to encircle the glans, so that there is strong suspicion that he has been trying to cure them himself on the line of march to Brecon from Devonport.

The pills were ordered to be repeated, and four grains of James's powder with calomel were given four times daily. A blister was applied to the nape of the neck ; the throat was ordered to be gargled with a solution of two drachms of nitre in two pounds of water ; and to the warts the sulphate of copper was ordered to be applied. Spoon diet, with tea, was prescribed.

5th. Blister has risen well ; pain of head relieved, and dysphagia less ; pulse 92 ; skin moist ; tongue furred ; bowels freely opened by the pills. The gargle was continued, and the diet, with the addition of sago.

6th. Dysphagia diminishing, and pain of head abated ; had rigors this morning early ; in other respects is as at last report ; thirst urgent. The patient was ordered to take, every sixth hour, half-an ounce of a mixture consisting of four grains of tartarized antimony, and one of Epsom salts in one pound and a-half of water.

7th. Passed a good night, but had this morning early a rigor ;

pulse 100; skin moist; bowels opened by antimonial solution; tongue cleaning. In the left cervical region there is considerable swelling, accompanied with much pain. Twelve leeches applied to the neck; the solution intermitted, and two colocynth pills ordered to be taken. Diet tea and sago.

8th. Leeches bled well, but no effect has been produced on the swelling, which has increased in size; pain of head gone; bowels freely opened; tongue clean; pulse 90; skin moist and cool; tumour hard and painful. The hydriodate of potass ointment was directed to be rubbed over the swelling. Diet as before.

10th. The tumour extends from the angle of the lower jaw as far down as the upper margin of the left collar-bone, and has increased under the use of the ointment since the 8th instant. Headach has recurred in an aggravated form; pulse 100, soft; countenance anxious; skin hot and dry. Hydriodate of potass ointment stopped, and ten drops of the tincture of iodine were directed to be taken twice daily, and a blister to be applied to the shaven scalp.

12th. Pain of head considerably relieved; tumour increasing and painful, and presenting much redness; skin hot and dry; pulse 120; bowels confined; tongue furred. A linseed meal poultice applied; tincture of iodine given up; two pills of calomel and colocynth.

April 13th. Passed a very restless night, having had several rigors; swelling softer, but more painful, and fluctuation commencing.

8 P. M. On being opened a considerable quantity of purulent matter, to the amount of half-a pint, was discharged, with great relief to the symptoms. Poultice continued till the 25th.

14th. Discharge continues profuse, and swelling is gradually subsiding. Pulse 76; weak; complains of great debility.

16th. Discharge as before; strength improving; skin hot and dry.

18th. Still considerable oozing of purulent matter from opening; pulse 90; had much diarrhoea during the night. Ordered six drachms of castor oil with ten drops of laudanum.

19th. Considerable quantity of purulent matter still exudes from the opening; but sloughing has taken place, and there is an ulcer about the size of a shilling immediately below the angle of lower jaw, and the opening made by the lancet for the exit of the purulent matter is also sloughing extensively. Pulse 80; tongue covered with a dry brown fur; debility increasing; bowels confined. Two grains of sulphate of quinine twice daily; one ounce of Epsom salts; and the same to be dressed with resinous ointment. Porter, pudding, sago, tea, and oranges continued.

20th. Passed a very restless night, and had two rigors this morning early. Pulse 100, compressible; diarrhœa urgent; complains of much tenderness in umbilical region; Both ulcers appear the same as at last report, but the sloughing has been arrested. Resinous ointment continued. Ordered six drachms of castor oil, with ten minims of laudanum. Sulphate of quinine continued.

22d. Purging has ceased, and the ulcers are enlarging; the integuments surrounding the smaller one immediately beneath the angle of inferior maxilla are sloughing extensively, whilst the larger one, the site of the original opening made by the lancet, situated a quarter of an inch above the clavicle, is inclined to granulate, although there is yet much discharge from the latter. Treatment continued.

24th. Superior ulcer more healthy, and sloughing ceased. Larger one granulating.

26th. Granulations increasing in lower ulcer, but sloughing process recurring in the upper opening; pulse, 80; tongue furred; bowels regular; skin hot and moist.

I was called suddenly at 5 P. M. to see this man, as considerable hemorrhage was taking place from both ulcers, more especially the upper opening. On my arrival, I observed blood to issue from the ulcers, from the mucous passages of the mouth and nose; the blood was arterial, and the quantity lost before my arrival amounted to seventy-two ounces. On seeing him the flow of blood was profuse, and in a continued stream from both ulcers, but especially from the one immediately below the angle of lower jaw, the stream was copious. By the application of the nitrate of silver, and, subsequently, of spirit of turpentine, accompanied with graduated pressure on the common carotid, the bleeding eventually ceased, but not till after the loss of fifteen ounces more. The pulse was 76, feeble; countenance anxious; complains of rigors and pain in joints. Compresses dipped in spirits of turpentine and nitrate of silver applied over the common carotid; two ounces of wine in water.

27th. 10 A. M. Passed a quiet night, and slept well, and there was no recurrence of the hemorrhage. Bandage not removed. Treatment continued.

11½ A. M. The hemorrhage has again taken place, but was arrested as before. On removing the compress, the blood flowed in jets from the upper ulcer to the amount of ten ounces, and it appeared to come from the external maxillary or facial artery.

5 P. M. Hemorrhage has recurred to the extent of thirty-two ounces. On removing the compress, the upper one is observed smaller, and is inclined to granulate; the lower ulcer is still dis-

charging purulent matter. The pulse was 90 ; features contracted ; debility great ; tongue furred ; bowels regular.

28th. A communication is now established between both ulcers, and there is now considerable discharge of purulent matter from both. A probe can be passed under the skin and cervical fascia at the lower opening, and made to protrude at the upper one. Treatment continued.

29th. No recurrence of hemorrhage ; passed a good night and slept well. Bowels have been regularly opened daily without the use of purgatives. Pulse 90, good ; debility increasing ; countenance anxious. Discharge of purulent matter continuing ; upper ulcer is closing from the application of the nitrate of silver. The lower one is about the size of a crown-piece ; granulations pale and irregular ; edges uneven. Treatment continued.

10½ P. M. Hemorrhage has occurred again to the extent of 7 lbs. not from either opening ; but the bleeding is now internal, and is discharged from the mucous passages of the mouth and nose, and was arrested with great difficulty, recourse having been had to the potential cautery, other means having by this time failed. The actual cautery was applied to both ulcers, with the view of constringing the vessels, although no blood was discharged from either, but from the mouth and nose. Treatment continued.

30th. No hemorrhage has taken place since last report ; integuments of neck surrounding ulcers very tense and inflamed ; discharge continues ; debility great ; bowels regular. Treatment continued.

May 1st, No hemorrhage since the 29th. The cautery, although not applied to the bleeding vessel itself, has been of service, for the ulcers have assumed a more healthy action, and the inflammation of the neck is less. Four ounces of wine. Treatment continued.

May 2d, Hemorrhage took place at 3 A. M. ; and at 8 A. M., amounting to 22 ounces, not from the ulcers, but entirely from the mucous passage of the nose. Pulse quick, 120, but weak ; countenance anxious ; 6 drachms of castor oil.

3d, At 1½ A. M. the patient was awakened from sleep, and brought up an immense mass of coagulated blood, about 2 lbs in quantity, from the larynx ; great debility ; pulse 120, small ; bowels confined. Five grains of nitre twice daily.

12 A. M. Hemorrhage has again taken place, fifteen ounces from the larynx and adjacent parts, so that the bleeding is now entirely internal, and the inferior thyroid artery is the vessel from which it proceeds. The upper ulcer has nearly closed ; the granulations of the inferior one are still pale and flabby ; the pus still continues to be discharged from the latter in small quantity.

4 P. M. Considerable hemorrhage, to the amount of 2 lbs., from

the larynx. Pulse at wrist barely perceptible ; features contracted : is sinking rapidly.

9 P.M. Coma has supervened, is now quite insensible. Pulse at wrist compressible.

4th, On seeing him this morning, I found his pulse had risen to 90, and that he had slept all the night. No occurrence of hemorrhage.

May 5th, No bleeding has occurred since the afternoon of the 3d instant ; sleeps well at night ; pulse 90 and fuller ; both ulcers are granulating, but edges are irregular and prominent ; bowels constipated ; tongue and skin natural. The ulcer touched with nitrate of silver ; four grains of sulphate of quinine daily ; six drachms of castor oil at bed-time.

6th, Passed a very quiet night, and slept till this morning ; no hemorrhage has occurred since that last reported, on the 3d instant ; pulse regular ; skin cool ; bowels opened by the castor oil draught given yesterday ; tongue clean. The ulcer under angle of inferior maxilla is granulating rapidly, cleaning, and cicatrizing, whilst the larger one, situated above the clavicle, has put on more healthy granulations ; his countenance is better ; the strength and appetite are daily improving ; his voice clearer and stronger.

12 P. M. A small quantity of blood was brought up from the larynx, amounting to about one ounce, in a coagulated mass.

7th, Pulse this morning weak and irregular ; ulcers as before ; debility increasing ; the discharge has now nearly ceased, except from the surface of the ulcers ; strength and appetite daily improving.

8th. This morning no hemorrhage has taken place ; improving daily.

9 P. M. Hemorrhage has recurred to fourteen ounces, but was easily arrested ; pulse regular ; bowels open ; had a rigor.

9th. No recurrence of rigors or hemorrhage ; ulcers as before ; pulse 90, regular. Medicines continued to 14th.

10th. Bleeding has not again occurred ; strength and appetite improving ; ulcers granulating.

11th. Slept well until the hemorrhage returned at 4½ A. M. ; in other respects as before ; lost ten ounces.

12th. At 8½ A. M. considerable hemorrhage took place from the larynx to thirty ounces.

11 P. M. Bleeding has again taken place to ten ounces from larynx, but ceased spontaneously.

13th. At 2 A. M. hemorrhage recurred from larynx, as also from nose, amounting to one pound and a-half.

9 P. M. Hemorrhage from the larynx to the amount of 18 ounces again recurred at half-past 12 noon. At 6 A. M. and 7½

A. M. bleeding to eight ounces took place. Erysipelas of left side of face appeared this morning.

Swelling and inflammation of left side of face subsiding; pulse 110, full; bowels open.

21st. at 11 A. M. Hemorrhage to about 6 ounces took place from the larynx; with this exception, there has been no return since the 14th instant. Treatment continued.

3 P. M. Hemorrhage took place to ten ounces.

5½ P. M. Bleeding has recurred to five ounces.

9 P. M. Hemorrhage from the larynx to ten ounces.

23d. 7 A. M. Hemorrhage occurred from larynx, lb. i. Notwithstanding increasing debility and the smallness of the pulse, the ulcers advanced favourably to cicatrization. The bowels were regular.

24th. No hemorrhage took place till the 27th, when it occurred at 10 P. M. to four ounces.

28th. Hemorrhage recurred, and (½ 5 A. M.) ceased spontaneously; lost two ounces.

29th. Ulcers cicatrizing; no return of hemorrhage; integuments surrounding lower one tender and swollen this morning.

30th. No hemorrhage; a small abscess about the size of a pea above larger ulcer, discharging purulent matter observed; strength and appetite daily improving. Pulse regular; bowels constipated; skin natural. Warm fomentations; 6 drachms^r of Epsom salts.

On the 31st, there was observed erysipelatous inflammation of the integuments in the cervical region extending upwards over the left side of the face as high up as external canthus of left eye; no recurrence of hemorrhage; pulse 100, full; bowels confined; tongue covered with a dry brown fur; strength improving. Diet continued.

June 1st. Erysipelas has now subsided a little, and no hemorrhage has taken place. The lower ulcer above clavicle has completely cicatrized; the upper one is still discharging slightly, and the small abscess reported on the 30th ult. on being punctured, discharged a little purulent matter.

3d. Erysipelas diminishing; no hemorrhage.

4th. Erysipelas has now entirely disappeared; no hemorrhage; strength improving.

7th. Hemorrhage recurred at 3 and 7 A. M. to the amount of four ounces.

After this time the hemorrhage did not recur. The appetite increased, and the strength and health were manifestly improved.

On the 19th, the neck presented two openings both immediately below the inferior maxilla; the one, the larger of the two, from which hemorrhage first took place; the one immediately be-

low the site of the small abscess above referred to ; the larger ulcer, the site of the original opening made for the exit of purulent matter, in the first instance, was cicatrized.

22d. Strength daily improving.

On the 24th, strength was so far regained as to enable him to get up for half an hour during the day.

The patient walked out on the 26th and 29th, and was improved by the change.

August 1st, This man now presents a fair hope of recovery from the excessive debility and emaciation caused by the loss of such large quantities of blood at different periods. The two small ulcers have all but cicatrized. The pulse, tongue, and skin, are natural ; bowels regular ; his voice clear, but there remains considerable rigidity of the left maxillary articulation. Between the 7th of August and the 20th, however, the rigidity of the parts gradually diminished, while the lower jaw recovered its faculty of motion. Ten weeks have elapsed ; and the patient enjoys good health. The two small abscesses have closed. The only appearance now observed is a slight discharge of pus from below the base of the maxilla, from the constant motion of the temporo maxillary articulation in mastication. Is still in hospital, but ere long he will be fit to go out and do pioneer's duty.

Remarks on the preceding Case.—The foregoing case is, I think, interesting in many respects.

First, in regard to the origin of the cervical abscess, it will be seen that it was not a scrofulous tumour. The little effect produced on the swelling by the preparations of iodine on the one hand, and the rapid suppuration caused by the application of poultices on the other, will show that it was not at all connected with this origin. *Secondly*, it appears that the man was a healthy soldier, and that all the ailments for which he had been under treatment in hospital for the last thirteen years were trivial, and that venereal disease in any of its forms has not constituted any of these, so that, consequently, it cannot be said to have had a venereal origin.

I observed in the detail of the case, that, shortly after his admission, I noticed his breath to exhale the mercurial fœtor, and that on inspecting the penis a crop of condylomata was found to encircle the glans, and that I suspected that he had been taking mercury to get rid of them, as they appeared irritable. This fact, he, however, denied, and stated at the time that he had been afflicted with warts as long as he had been a soldier.

He had a simple bubo, unaccompanied with any ulcer of penis, in September 1841, said to be produced by a stroke from a firelock by a man in the rear rank. This disappeared by cold applications, and

I saw no more of him until he was readmitted a few days afterwards with slight acute catarrh. An attack of acute dysentery, from the 28th February to March the 4th, at Devonport, in 1842, was the last complaint for which he was under treatment, till admitted with the present disease. The three diseases specified are the only ones he has been affected with during the last five years, and the only times he has been in hospital since he returned from the Cape of Good Hope.

I, therefore, cannot account for the origin of the abscess, as his previous disease appears to bear no connection with the present complaint.

The quantity of blood lost at sixteen different periods was 560 ounces, or nearly 10 ounces short of 48 lbs.

I was inclined to think at first that the external maxillary artery was the bleeding vessel, as the blood in the first instance appeared in a fissure produced by sloughing below the angle of the inferior maxilla, and taking the course occupied by the digastric triangle. The ulcer which in the report has been called the upper one, is that which was produced by sloughing, and occupied the site of the digastric triangle, following the base of jaw to within half an inch of the *symphysis menti*, whilst the lower one was that made for the exit of the pus situated in the anterior inferior triangle of the neck above the clavicle. When, however, the ulcer in the digastric triangle closed, which it shortly did, then all the hemorrhage was internal, and large quantities of blood were brought up from the larynx.

From the constant motion of the lower jaw there is still an awkward cicatrix in the upper ulcer, and it is constantly liable to open.

*Brecon, South Wales,
August 20th 1842.*

ART. IX.—*On the comparative frequency of the morning and evening Pulse.* By THOMAS STRATTON, M. D. Edin.

THE question, whether the pulse varies in frequency according to the time of the day, is still undetermined, the opinions of different writers on the subject varying considerably. Perhaps the best mode of approximating to the truth is to take the average of a number of observations made by medical men on their own persons, as when taking the pulse of others, whether patients or not, the observer may be ignorant of many causes which may have contributed to accelerate or retard it.

If we make the observation on lay persons in a state of health, their circulation may be affected by melancholy or glad tidings, or

certain ingesta, which they may not mention, or of the effect of which they themselves may not be aware.

In the case of sick persons the difficulty is still greater, as they generally have some disobedience in diet to conceal; hospitals, whether civil or military, afford the best opportunities for researches of this kind, but even these are not at every moment of the day hermetically sealed to the introduction of certain stimulants.

Though, as is well remarked by Professor Guy in his interesting paper in the *Edinburgh Medical and Surgical Journal* for January 1841, observations on the pulse made incidentally are preferable to those made for this particular purpose, as the observer cannot be influenced by any bias, still, as the former are not sufficiently numerous, we must have recourse to the latter.

The old opinion on the subject was, that the pulse was slow in the morning, and rose as the day declined, the excitement of the day's occupations accelerating it more and more till, towards night, when the animal machine sinking into repose, it then became slow.

The tide of opinion was turned by Dr Knox, who came to a conclusion exactly the opposite, namely, that the pulse is slower in the evening than in the morning.

In minute observations of this kind, it is necessary to guard against being blinded by preconceived ideas. Having been one of Dr Knox's pupils, I might have preferred his conclusions to those of others up to the time that I examined the subject myself, but, like all who have attended his class, I know that one meaning of ours, being a liberal profession, is, that every member is free to form his own opinion.

The following observations were made on my own person, (aged 25), and in the sitting posture.

TABLE I.—In thirty-four daily observations on the pulse (18th November–24th December 1841), on twenty-nine days, the morning pulse was higher than the evening, and on five days it was lower.

	Beats.	Difference.
The highest morning pulse was	91	4 beats.
... evening ...	87	
lowest morning ...	68	5
... evening ...	63	
The average of the morning pulse is	82	9
... evening ...	73	

According to this series, the morning pulse is higher than the evening, except once in nearly every seven days, ($6\frac{4}{7}$ days more correctly.)

TABLE 2.—In seven daily observations, (25th–31st December,) the morning pulse was higher on six days, and slower on one day.

	Morning.	Evening.	Difference.
Highest,	92	84	6
Lowest,	76	64	12
Mean,	83	73	10

TABLE 3.—For seven days (1st–7th January 1842), the morning pulse was quicker on five days, slower on one, and the remaining day, they were equal.

TABLE 4.—For seven days (19th–25th January), the morning pulse was higher on all the days.

TABLE 5.—On twenty-three days (23d February–16th March) the highest pulses were, 19 morning; 3 evening; 1 equal.

TABLE 6.—To take the average of all the series :

Table.	Pulse.		Equal.	No. of daily Observations.
	Higher.			
	Morning.	Evening.		
1	29	5	0	34
2	6	1	0	7
3	5	1	1	7
4	7	0	0	7
5	19	3	1	23
	66	10	2	78

After deducting the two equal days from 78, we have in 76 days, the morning pulse quicker than the evening on 66, and slower on 10 days; the evening pulse being the quicker once in $7\frac{1}{2}$ days.

This subject, like some others, has derived much of its importance from the different views that have been taken of it. These opinions may be briefly stated as follows :

1. That the pulse is slower in the morning than in the evening.
2. That it is of the same frequency morning and evening.
3. That it is slower in the evening than in the morning.
4. That in two-thirds of cases it is slower in the evening, and in one-third it is quicker.

The first opinion is the oldest; like the common law, it was received without any reflection or observation, and was afterwards adopted by Keill,* (1718), Robinson,† (1732), and Falconer,‡ (1796.)

The second opinion, though not expressed in so many words, is agreeable to some incidental observations by Dr Prout,§ (1814.)

The third opinion is that of Dr Knox,|| who has the merit of leading the way in this inquiry, and showing that the former ideas on the subject were erroneous; in four individuals examined, his theory was found correct, and also in some incidental observations by Dr Saunders.

The fourth opinion is agreeable to the experiments of Profes-

* *Medicina Statistica Britannica.*

† *Animal Economy.*

‡ *Observations on the Pulse.*

§ *Thomson's Annals.*

|| *Edinburgh Medical and Surgical Journal*, Vol. xi.

Dr Guy,* and to these I may, perhaps, be allowed to add for the present a fifth, namely, that out of seven days the pulse is quicker in the morning on six, and slower on one day.

TABLE 7.—To take the mean of the experiments made by Dr Knox, Dr Guy, and myself.

	No. of Observations.	Morning Pulse.	
		Higher.	Lower
Dr Knox, (say)	7	7	0
Dr Guy,	3	2	1
Myself,	7	7	1
	17	15	2

According to this, the morning-pulse is higher than the evening, except once in eight and a-half, or twice in seventeen days.

It would be desirable to have additional observations on the pulse in a state of disease, and on the pulse of women, both in health and disease.

Kingston, Canada,
September 1842.

ART. X.—1. *Case of enormous Hydropic Distension of the Abdomen, which (besides great accumulation in the cellular tissue) contained 59 pints of fluid, Imperial measure.*

2. *Case of large Aneurism of the Aorta bursting into the right pleura.* By Sir DAVID J. H. DICKSON, M. D., F. R. S. Ed., F. L. S., Inspector of Hospitals and Fleets, &c. Vice-President of the African Institute of Paris, &c.

1. I have lately met with a still more extraordinary instance of general dropsy than that recorded in the 36th volume of the *Medico-Chirurgical Review*, the particulars of which were read at the last meeting of the British Association at Manchester, in which the limbs were greatly swollen, and the abdomen so enormously distended, that it measured $4\frac{3}{4}$ feet in circumference. But I shall subjoin only a very brief outline of the case, from the imperfect account given by the patient himself, and which, indeed, comprises almost all the important particulars with which I am acquainted.

Mr James Frazer, superannuated boatswain, aged 65, stated that he had been affected with general dropsy for nearly two years, and that the disease had supervened on a severe attack of rheumatism; he had only returned from Jersey within the previous week. On seeing him I had not the slightest hope of being of any service to him; but, as he was destitute of proper necessaries and at-

* Edinburgh Medical and Surgical Journal, January 1841. Medical Gazette, June 1839. Guy's Hospital Reports, No. 8.

tendance, I acceded to his earnest request to be admitted, with the view of alleviating, as far as possible, his sufferings in his last moments. He was received into the hospital on the 16th April, at 3 o'clock P. M., and died early next morning. Besides the great distress, dyspnoea, and cough experienced from the enormous swelling of the abdomen, the lower extremities also were so loaded with serous effusion, that the integuments of the left leg (which, from the knee to the ankle, were of a fiery red colour, in some places very dark, and fast running into gangrene and sloughing,) had given way, and thus somewhat relieved the turgescence of the limb by a profuse discharge of serum.

The following are the principal morbid appearances disclosed by dissection 23 hours after death.

The abdomen contained 29 imperial quarts of very viscid straw-coloured serum, which coagulated firmly on being heated. The visceral peritoneum was of a deep-red or livid colour, and much thickened; the intestinal canal was dilated. The liver was about the natural size, but dense and indurated, and so much altered in shape as to resemble a very large kidney. The spleen and kidneys were nearly normal. The heart was considerably enlarged, and the pericardium was universally adherent; the left ventricle was hypertrophied, and the mitral valves were thickened and cartilaginous, so as to narrow the corresponding aperture, reducing it to a transverse slit. The lungs were congested and slightly oedematous.

I believe the accumulation of fluid in this instance to have been one of the largest, if not the largest on record; but I have not investigated this point. It appears to have exceeded by two pints that quoted from the "*Ephemerides Naturæ Curiosorum*," in Dr Good's Nosology, page 438, where the quantity evacuated by paracentesis (I presume he means at one operation) amounted to 68 pounds; for, in the present case, 27 imperial quarts were drawn off by tapping *post mortem*, and about two more remained in the cavity of the abdomen, being nearly equal to 70 pints of the old measure.

2. *Aneurisma Thoracicum*.—Mr John Anderson, boatswain, aged 45, who had been admitted for obstinate constipation a few days previously, and had been left sitting on his bed a few minutes before, suddenly became faint, fell back and expired.

Inspection of the body twenty-four hours after death. The cavity of the right pleura was found to be almost filled with blood, which had separated into serum and crassamentum; the former amounted to three pints, and the coagulated portion, which was exceedingly firm, weighed about three pounds. The hemorrhage had proceeded from a large aneurism of the thoracic aorta, which resembled a cocoa-nut in size and shape, and corresponded to the

three last dorsal, and first lumbar vertebræ, the bodies of which were carious and deeply eroded, while the intermediate fibro-cartilages were, as usual, sound, and projected into the interior of the sac. The œsophagus adhered closely to the anterior wall, and was much flattened. The sac contained a fibrinous coagulum, distinctly laminated, together with a quantity of semifluid blood in the centre. The orifice leading into the right pleura had a lacerated appearance, was situated close to the spine, and capable of admitting the little finger. The left ventricle of the heart was hypertrophied, and its cavity diminished, but the valves were sound. The aorta was generally dilated, the lining membrane thickened and puckered, and numerous calcareous deposits existed between it and the middle coat. The stomach, liver, and kidneys were natural, but the spleen was very small, and the intestines, especially the colon, much dilated.

This instance, although much smaller, resembled, in many points, the extensive thoracic aneurism which I detailed in the thirtieth volume of the *Medico-Chirurgical Review*; but neither could be at all compared in magnitude with the enormous ventral aneurism of the aorta, of which I published a description in the twenty-first volume of the *Transactions of the Royal Medical and Chirurgical Society*, and which, I believe, is the largest on record.

ART. XI.—*The condition of the Blood in the Veins in the natural and the disturbed states of the Animal System.* By G. CALVERT HOLLAND, M. D., Physician to the Sheffield General Infirmary.

INQUIRY I.—*Properties of the Veins and the peculiarities of the Venous System.*

THE forces employed in the circulation of the blood cannot be examined altogether independently of each other. They are so intimately connected, co-operating in the production of the same general effect, that the whole will frequently be brought, more or less, under review. Previously to the consideration of the powers by which the blood is moved in the veins, it is important to determine the origin of these vessels, otherwise the evidence of the forces acting *a-tergo* will necessarily be defective.

Haller regards the origin of the veins as numerous as the terminations of the arterial system, and the same view has also been generally entertained by subsequent writers. Bichat contends that the veins arise from the general capillary system. Magendie has shown that the venous radicles are continuous with the arteries and lymphatics; and the discovery of a communication between

the lymphatics of the intestines and the mesenteric veins,* in some animals is in favour of this opinion. With this exception, the venous radicles are generally considered to originate in the arterial capillaries, and the connection between the two is regarded as direct. That such connection exists, is, of course, indisputable; but there may be other channels of communication with the venous system, which the elaborate investigations of physiologists have not yet discovered.

The termination of lymphatics in veins is an important fact in relation to the present inquiry. It shows that fluids flow into these vessels independently of the action of the heart; and were the same result observed with respect to other minute vessels, the received doctrines on the circulation would necessarily be greatly modified. By these we are taught that the blood is urged through the capillaries into the veins by the impulse of the left ventricle. The fact on which it mainly rests is the direct connection between arteries and veins. The capillaries examined by the microscope present phenomena which can scarcely be adduced in confirmation of this opinion, though they are usually regarded as furnishing decisive evidence in favour of it. The following description of capillary circulation is given by Magendie, the accuracy of which will not be questioned.

“Your eye has followed the progress of the globules suspended in a transparent fluid; you have seen them roll over each other, and jostle each other, sometimes advancing singly, sometimes presenting several abreast, without the circulation appearing to be for a moment obstructed or suspended. What I most desired to make perfectly obvious to your sight was the place of motionless repose close to the parietes of the vessels, our knowledge of which is due to M. Poiseuille. None of you can now call its existence in question; the sluggish motion of the globules which approach it, and the total stoppage of those which are plunged in it prove abundantly that the whole of the sanguineous column does not take part in the movement. Besides, is it not evident that there is an interval between the circumference of the cylinder and the part occupied by the current? This interval is necessarily filled by a liquid, and that liquid, from its transparency, can be nothing but the serum. The capillaries of a certain diameter were the most suitable for this observation; for, having arrived at an extreme degree of tenuity, there was nothing to be seen, but a small thread of fluid, which could detach them from the place of motionless repose. On the contrary, when the vessel presented some volume, nothing was easier than to verify the different degrees of rapidity of each globule. In the centre there was a rapid propul-

* The researches of Dr Fohman.

sion; more out of it, a slackening of motion; close to the parietes, a complete stoppage.

"The progression of the column was by no means always regular. We saw from time to time, stop, briskly resume its course, project itself towards a collateral branch, to the right, to the left, and flow back without the physical conditions of the canal appearing to have been in the least possible degree modified. We have briefly recalled to your recollection the explanation of these phenomena, on which we have already dwelt enough. I shall not return to the subject."*

Does this picture of capillary circulation establish the influence of the left ventricle? Were it the cause, the contents of the capillaries would be urged simultaneously forward. The small columns of blood are not, however, marked by a regular progressive motion. At one moment they are suddenly arrested; at the next, they resume their course towards a collateral branch, to the right or left; or flow in a retrograde direction. The globules do not exhibit the same condition in any single point of the capillaries. When contiguous with the sides of the vessel, they are nearly at rest: when approaching the centre, they move with accelerated speed.

The pressure which is imagined to be transmitted to, and through the capillaries, does not, according to this picture, affect the whole of their contents. The irregular movement of the globules is not explicable on this supposition. It must be referred either to their own vital properties, or to the action of the vessels. This description, it is important to bear in mind, is derived from an examination, not of the exceedingly minute, but of the larger capillaries; consequently it remains yet to be determined in what manner blood circulates in the former. Their extreme tenuity eludes, however, accurate observation.

It is the opinion of some that the communication between arteries and veins is not maintained by vessels, but by channels destitute of membranous parietes. The dispute concerning the nature of the connection shows the difficulty of the question, and the perplexity in which it is involved. The influence of the heart on venous circulation has been inferred by the easy transmission of fluids from arteries into veins. Open channels existing between the two, the pressure of a column of blood in the one, is stated to account for the rise of blood in the other to an equal height. The tendency of fluids to establish an equilibrium is supposed to place the fact beyond all cavil. The hydrostatic principle does not strictly apply to the phenomena of circulation. We admit that fluids may be made to pass from arteries into veins, but this is

* *Leçons sur les Phénomènes Physiques de la Vie; par M. Magendie. Tome iii. 1837, pp. 343, 344.*

no evidence that, in the natural state of the vital powers, the blood flows into the latter, either from the direct contraction of the left ventricle, or the pressure of the arterial column. The fact is assumed, and not proved. In the preceding investigations, it has been shown that the capillaries exercise an independent action, in virtue of which the blood they receive is conveyed into the veins. If such power exist between the arterial and venous systems, with what force of argument can it be laid down, that the blood in the latter ascends from a tendency which fluids have to find their level? Were the connection between the two systems maintained by inert tubes, the reasoning would be perfectly just, but only on this supposition. Before entering on the discussion of the subject, we shall offer a few general remarks on the venous system, the striking conditions of which are thus accurately described by Bichat.

“ 1. General pulsation in the arteries ; absence of this general pulsation in the veins. 2. Rapidity of the current of blood in the arteries ; sluggishness of the same current in the arteries. 3. Greater capacity and thinner parietes of the veins ; smaller capacity and greater thickness of parietes of the arteries. 4. Necessity of accessory aids in the venous circulation ; absence of such necessity in the arterial. 5. The jet of blood in the latter being effected *per saltum*, in the former being uniform. 6. The liability of blood in the veins to be influenced by gravitation and other adventitious causes ; the absence of all such influence in the arterial movement. We have here a series of phenomena which, after what has been said, must evidently depend on the existence of an impelling agent at the origin of the arteries, and the absence of such an agent as that of the veins.*”

The parietes of the veins are much thinner than those of the arteries, and in common with them are enveloped in a loose filamentous tissue derived from the organs in which they are placed. Their middle or proper venous tunic is composed of fibres, having almost exclusively a longitudinal direction. They are softer and more extensible than those of arteries ; their internal membrane is smooth and highly polished. It is much thinner than the corresponding arterial membrane, but is much more distensible and less fragile. This membrane is the most extensive and uniform in its distribution of all the venous tissues ; it is, indeed, the only one found in the substance of organs, as in the liver, kidneys, spleen, and brain. In certain veins, it presents folds which are named valves, the office of which is to prevent the retrograde motion of blood. The veins are much more dilatable in the transverse direction than the arteries, but less longitudinally. The

* Anatomie Générale précédée des Recherches physiologiques sur la vie et la mort ; par Xav. Bichat. Tome premier, p. 387.

difference in the circulation of blood in the two classes of vessels requires this modification. In many slight, as well as serious derangements of the vital powers, congestion frequently occurs in the veins, but never in the arteries. In these the blood readily flows forward, impelled by the contraction of the left ventricle; but in the former the circulation is often impeded, and occasionally the blood accumulates in them to an extraordinary degree. The extensibility of the veins may be shown to exercise an important function in the animal economy. These vessels being enabled to receive and retain an inordinate quantity of fluid, the heart, lungs, and other viscera are necessarily protected from frequent causes of derangement. Were the blood, which is thus accumulated, distributed among these organs, depression and disorder of the vital energies would be induced, and, perhaps, fatally. This function of the veins is susceptible of copious illustration, but in this stage of the inquiry, we can only allude to it.

The contractility of the veins is admitted by most physiologists, and is stated to be much greater in a lateral than a longitudinal direction. This property is imagined to be proved by various and conclusive experiments. When a ligature is passed round a vein, the blood, on the side of the heart, flows forward. When two ligatures are applied, the blood, in the included portion, is projected, on the vein being punctured. The venous current, in escaping, is considered to be modified by the contractility of the vessel. The influence of this power is supposed to be observed in a peculiarly marked degree in the superficial veins. In summer they are dilated; in winter they are greatly contracted. The immersion of any part of the body in warm or cold water presents similar phenomena. These facts are interesting, but by no means so unexceptionable and conclusive as is imagined. It is denied by some writers that the veins possess any contractility. One who has given much attention to this subject remarks, that "the veins are neither irritable nor elastic; they are very dilatable, but have no reaction."* The blood beyond the ligature flowing towards the heart is certainly no proof of the exercise of contractility. Before the application of the ligature it was moving in this direction, at least, in virtue of one power, *the vis a tergo*, and perhaps facilitated in its course by changes in the capacity of the chest. The ligature cannot possibly subtract the motion previously imparted, and if any part of it is derived from causes acting in advance of the stream, the means employed are clearly incapable of determining the question.

The application of the ligature may be shown to urge the blood forward. Were the vein removed from the body and filled with water, this would readily escape from any aperture, left open, on

* Dr Carson.

passing a ligature around the vessel. The experiment cannot possibly be adduced as proving that venous circulation continues from the contractility of the veins. The projection of blood from the portion included between two ligatures, admits of explanation widely opposed to the received doctrine. The ligatures cannot be applied so that the extent of vein included shall contain the ordinary quantity of blood. If the ligature on the side of the heart be tied last, the quantity will be less than natural; if first, greater. But supposing both ligatures to be simultaneously adjusted, to obviate this objection, the contents of the vein will inevitably be increased. The pain inflicted on the animal, previously to and during the experiment, will render the breathing quick, constrained, and laborious, and the invariable effect is distension of the venous system. Hence the vein included between the ligatures is not placed in its ordinary condition. The contents are augmented by the experiment, and being suddenly arrested, the blood will clearly be projected on puncturing the vessel, not from the contraction of the venous parietes, but from the tendency of it, the globules of which it is composed being in agitation, to flow where the resistance is the least. These circumstances have never been taken into consideration by physiologists. The conclusion has been arrived at without even suspecting the possibility of fallacy. Admitting that contractility is the cause of the phenomenon, the experiment does not elucidate the influence of this property on the venous current in the undisturbed conditions of the system.

The jet of blood in venesection is asserted to be modified by the contractility of the punctured vessel. There is no proof of the fact. The changes observed in it are attributable to the contraction of muscles in the vicinity of the vein, or to the altered character of the breathing. They may be produced at pleasure. Coughing or strong expirations will invigorate the stream. A continued series of deep inspirations or almost suspended breathing will arrest or enfeeble it. All muscular actions cause the blood to be projected with increased force. Contractility is further to be established by the manner in which the superficial veins are affected by cold and heat. In the one case they are constricted, in the other dilated. These effects are evident, and much less exceptionable than the preceding phenomena. They occur, indeed, in the natural condition of the vital powers, but are not altogether free from objections. Cold will constrict the arteries as well as the veins on the surface of the body. The influence exerted cannot possibly be partial. The pale and exsanguineous appearance cannot, therefore, be referred to the contraction of one class of vessels only. The capillary arteries being similarly exposed and affected will carry a diminished quantity of blood to the veins, and hence the reduced contents of these vessels cannot just-

ly be referred to the contractility of their parietes. The phenomenon may arise mainly from the depression of the capillary arteries. If these carry a stinted supply of blood to the surface, the veins, as a necessary consequence, will receive less.

The dilatation of the veins from external heat requires few words. They are admitted to possess extensibility in a remarkable degree, and it is apparent in all cases of congestion. They are also endowed with contractility, but to a very limited extent, nor does this property accelerate the circulation of venous blood. This is slow and equable, exhibiting no pulsation, except occasionally in the vicinity of the heart, from the contraction of the right auricle.

The disproportion in the capacity of the arterial and venous systems is an interesting and important fact connected with the present inquiry. Many of the early physiologists endeavoured to determine the amount of the difference; there is not, however, any strict agreement in their calculations, nor is it indeed possible to acquire accurate information on the subject. The means usually employed can make only a distant approximation to the truth. Injections distend the vessels, especially the veins, consequently present a greatly exaggerated capacity; but independently of this difficulty, the difference between the two systems is not constant and unvarying, but changes from birth to advanced age. In early life, the arteries have a greater proportional capacity than at any subsequent period. At this time they are exceedingly active, as is evident from numerous phenomena; and this energy of function is necessary to nourish and develope the body. It diminishes with the progress of years, during which the veins gradually acquire an increased capacity. The difference between the two systems is very striking in old age, particularly in weak or debilitated constitutions. At this period, not only the deep-seated, but even the superficial, veins are greatly enlarged. These changes are principally attributable to two causes; the lessened energy in the propulsive powers of the blood, and the narrowed circle in which the fluid is confined. The heart, the arteries, and capillaries possess little of the activity of early life, nor indeed are their actions invigorated by the various circumstances which exercise considerable influence at this season, such as the gay and buoyant feelings of the mind—the strong and frequent muscular contractions of the body, inseparable from the sports and pursuits of youth—abundant and well-digested food. These causes tend very powerfully to invigorate the motion of the blood, and to equalize, as far as the natural capacity of the two systems will admit, the distribution of the vital fluid. In the decline of life, these secondary, but important, conditions exist but in a diminished degree. The circulation is also materially circumscribed. The capillaries, which in early life are exceedingly numerous, gradually become obliterat-

ed in the progress of years ; the inevitable effect of which is to give to the larger vessels, especially the veins, a greater proportional quantity of blood. It is worthy of remark, that in all cases of debility, whether in consequence of age, temporary or permanent disease, the blood always accumulates in these vessels. They are a reservoir from which the arteries derive a supply on the returning symptoms of health. Without such provision recovery would frequently be impossible. The improvement gradually re-establishes the balance of circulation, and this effect tends to strengthen the animal system before there is much nutritive matter received from without. These changes are not only interesting in a physiological point of view, but have the most intimate relations to inquiries concerning the nature and treatment of diseases. They have not, however, been studied with much attention, nor have their importance been at all justly appreciated. We cannot stop to expatiate on the practical value of a knowledge of these changes. The field, though rich, must remain for subsequent cultivation.

It is evident that the two columns of blood, the arterial and venous, are greatly modified in the different stages of existence. The venous system always exceeds, and to a considerable extent, the capacity of the arterial ; but much less from birth to maturity, than from this period to advanced age. When the heart and its associated organs of circulation are the least capable of propelling their contents, the column of blood to be moved in the veins is the greatest, and yet eminent physiologists contend, that this is directly influenced by the contraction of the left ventricle, and is deemed the only efficient cause of motion. The difficulties with which this opinion is fraught have led inquirers not only to doubt its soundness, but to propose a very different explanation.

The removal of pressure from the upper part of the column, by the dilatation of the chest, has been regarded as necessary to account for the circulation of blood in the veins. If we consider that the venous column is augmented, and the *vis-a-tergo* diminished, with advancing years and varying conditions of the body, the prevailing opinion will be acknowledged to rest on questionable data. Haller, in his elaborate work on physiology, presents numerous calculations of the capacity of the two systems. Estimates are given of the relation between arteries and their corresponding veins, and it is shown that the capacity of the latter always exceeds that of the former, and in some instances almost to a quadruple extent. The difference between the smaller arteries and veins is rather a matter of conjecture than experiment. It is, however, admitted by all writers, that the latter greatly surpass, both in number and capacity, the former. The difference between the two systems is represented by Haller, in the ratio of 4 to 9. This can be regarded, however, only as a distant ap-

proximation to the truth, and does not convey any idea of the temporary or permanent changes produced by disease, in which the difference will be much greater.

An inquiry into the powers which move the blood in veins would be imperfect, unless certain peculiarities belonging to the venous system were noticed. The consideration of them will show how improbable the doctrine is, that the force of the heart extends through the venous radicles to the right auricle. The manner in which circulation is carried on in the brain affords a strong objection. The arterial blood sent to this organ is distributed throughout its substance, as in other parts of the body, the connection between the ultimate capillary arteries and veins has, however, something peculiar in its character. The latter, in place of pouring their contents into trunks capable of maintaining a uniform pressure from the left to the right side of the heart, convey them into membraeous reservoirs, termed sinuses, formed by the separation of the plates of the *dura mater*. These sinuses communicate with each other, and are the only channels connecting the proper cerebral veins with the jugular. It can scarcely be contended that the blood moves in these sinuses in virtue of the impulse of the left ventricle.

The arterial fluid meets with many obstacles in its flow to the brain. It circulates against its own gravity, and much of the force with which it is propelled is lost in striking against the angular curvature formed by the internal carotid in its passage through the petrous portion of the temporal bone. The blood which enters the cranium is very much retarded in its motion by the peculiarly situated, as well as the minute divisions of the arteries, previously to arriving at the cerebral substance. These conditions protect this delicate and important organ from shocks which would be felt were the blood sent to it in a copious and uninterrupted current. The contemplation of these conditions will scarcely allow the supposition, that the force of the heart, immensely weakened by the difficulties opposed to the transmission of the blood, is, nevertheless, sufficient to urge this through a mass of arterial and venous capillaries, and at length through large sinuses, which cannot aid the circulation, to the termination of the veins in the right auricle. The force adequate to the production of this effect is certainly not furnished by the heart.

A just explanation of the phenomenon is found in the powers possessed by the capillaries. The heart conveys the blood through the arteries and their subdivisions, but when it reaches vessels of exceeding tenuity, it no longer circulates from a *vis-a-tergo*. The blood, after this complicated and devious circulation, will unquestionably flow into the jugular veins in a slow and equable stream. The direct influence of the heart cannot possibly be traced in them. A contrary opinion is, however, maintained by an ingeni-

ous writer, but on very slender grounds. The occasional pulsation of the jugular veins is attributed by him to this cause. "The arteries which convey the blood to the head throw this fluid into the cranium by synchronous jets. An equal quantity, according to the hypothesis contended for, must, at the same instant, be discharged from the cranium into the veins. This must also be by jets which cause successive currents, or, in other words, pulsation in these veins."* The blood in no part of the venous system receives and exhibits the successive impulses of the heart. Its long and tedious passage through the minute capillaries, divided into globules, circulating alone or in pairs, render it incapable of transmitting to the contents of large veins the successive contractions of the left ventricle, or of flowing into them from its numerous channels, in times exactly corresponding with these contractions. The globules can neither communicate the force originally impressed upon the arterial column, nor can they retain it, so that when collected the stream resulting moves in jets synchronous with those of the arteries. This effect cannot possibly be produced by the transmission of blood through capillaries, and it is less likely to occur in the jugular veins than in any vessel except the *vena cava hepatica*.

The imagined necessity of a quantity of blood escaping from the cranium, precisely equal to that which enters, is no corroboration whatever of the opinion of this ingenious physiologist. When the vital organs become diseased, the strict relation between the two quantities is interrupted, and yet the blood continues to circulate. The phenomenon is observed, and in a very marked degree, whenever, from disease of the lungs or heart, the blood is prevented from flowing freely into the pulmonary artery. The pulsation arises from the retrograde motion of the venous fluid, and not from the successive impulses of the arterial. It invariably exists in the circumstances mentioned.

Another remarkable peculiarity in the venous system presents itself in the liver. The arterial blood which has been sent to the abdominal viscera passes, after performing its respective functions, into venous radicles, and ultimately into capacious veins. These, however, do not convey it to the heart, but terminate in one large vessel, the *vena portarum*, which enters the liver, and divides and subdivides into minute branches after the manner of an artery. The blood is again collected by venous radicles, which unite, forming gradually converging trunks, and at length one capacious vessel—the *vena cava hepatica*. Hence, in this instance, the blood, before it arrives at the heart, has circulated through four sets of capillaries, one arterial and three venous. Is the impulse of the heart adequate to this complicated circulation? To suppose it capable of urging the blood through this extensive and de-

* Dr Carson.

vious course, without deriving any assistance from the capillaries, is ascribing to it an extraordinary power. In previous investigations the influence of respiration—of the heart—arteries and capillaries, on the motion of blood, has been studied, and in pursuing the present inquiry, a reference to results and experiments which have already been brought under consideration is unavoidable—the same experiments being adduced by physiologists in confirmation of their views with respect to arterial, venous, and capillary circulation.

(*To be continued.*)

ART. XII.—*Case in which the symptoms of acute Farcy appeared in the human subject.* By DAVID CRAIGIE, M. D. &c.

JOHN DIXON, aged 61, omnibus driver, was brought to the Royal Infirmary on the evening of Wednesday, November 16, 1842, in a state of imperfect sensibility and consciousness, with low delirium, and unable to answer questions. His wife informed the nurse that he had been ill for eight days, with delirium, but without marks of fury or violence; pain in the head; diarrhœa, with occasional vomiting; and pain generally felt over the whole person on being touched.

At the period of admission, the delirium was low and muttering, with constant tremulous motion of the lower jaw, fluttering of the eyelids, trembling of the hands, *subsultus tendinum*, and general restlessness. He attempted to comprehend questions when put directly, but seemed not to understand them, and answered incoherently, and spoke inarticulately. The pulse was very small, and feeble, and very rapid. He passed water and stools in bed. The catheter was introduced, but little water was withdrawn. The urine was high-coloured, and exhaled a strong ammoniacal odour. The legs presented several discoloured patches, the apparent cicatrices of old ulcers, and foul crusts apparently covering others, some recently scabbed over. On the extremities and various parts of the body, were several soft slightly elevated tumours, of an elliptical shape, and dull-red colour, and some of which were elastic and beginning to suppurate.

The whole of the skin and integuments covering the lower jaw were affected with diffuse swelling in a slight degree; and the lymphatic glands beneath the jaw were felt somewhat enlarged. On the left side of the chin, extending backwards to the angle of the lower jaw, was a diffuse red swelling, with some hardness; and the surface of the skin was covered with numerous closely set and broad whitish-coloured bodies, which at first sight resembled tubercles, but upon careful examination presented the appearance of vesicular pustules. These were circular or nearly so, about two lines in diameter, distinctly elevated above the surrounding skin,

and presented broad, flat, whitish summits, as if formed by the cuticle covering an opaque puriform fluid. The skin on which these vesicular pustules was set, was hard, firm, and inelastic, as also the intermediate skin, where they did not cohere. The surrounding skin of the cheek, however, was, at the distance of one or two lines, soft and natural.

The breath and person of the patient exhaled a fetid, very offensive odour.

According to the account of his wife, he was in the habit of taking spirits, but not to drunkenness. He was first seized with delirium about eight days before the present time, that is, 8th November, having, for a day or two previously, talked a good deal in his sleep, and started; but it did not appear that he had any spectral phenomena. He also, from the first, was peculiarly sensitive all over his body, and on being touched, complained of acute pain. He did not vomit.

He was ordered one ounce of wine every second hour; and a blister was applied to the shaven scalp.

On the 17th, he had spent a pretty good night, and had seemed to sleep; but the spasmodic motions of the muscles of the lower jaw continued. The sensibility and consciousness were still very imperfect; he lay in a stupid and semicomatose state; but when roused and addressed made attempts to answer in thick inarticulate sounds. Diarrhoea continued, and the contents of the bowels were represented to escape unconsciously. The pulse was between 112 and 116. The respiration about 30, irregular, with irregular motion of the chest, and more abdominal than thoracic. He did not appear to cough, and no expectoration was produced. But the fetid odour continued. The skin was very hot and dry, and there was much thirst; the tongue was imperfectly protruded, the apex red and dry. The blister had risen well; three motions had taken place.

Ten grains of chalk and opium powder were ordered to be given, and repeated at bed-time. An enema with one ounce of oil of turpentine was administered; the wine was continued; and a mixture of camphor and carbonate of ammonia was prescribed.

18th. One copious motion from enema, but since that bowels had not been moved. The pulse was 112, of good strength; the subsultus was rather diminished. He was, however, unwilling or unable to protrude the tongue. The vesicular pustules on the left side of the chin were larger and more distinct; some were broken, and were discharging bloody serum. Respiration was 44, rather irregular and panting. Sensibility and consciousness were very imperfect.

The wine was continued, and one pint of ale was allowed him. Pills, also containing each four grains of camphor, were given every third hour.

Two colocynth pills, and one drachm of compound jalap pow-

der were ordered ; and if diarrhœa continued, ten grains of Dover's powder. A mixture of spermaceti ointment and saponaceous tincture of camphor was applied over the eruption.

19th. Several motions ; respiration 72, but evidently irregular and spasmodic, mostly abdominal. Pulse 92, extremely small ; countenance more pale and cadaverous than yesterday. The patch of red hard skin on left side of jaw was much the same as yesterday ; but the white pustules were larger, and coalesced more together than yesterday, and the discharge exhaled a heavy fetid odour.

Over the lower extremities, the trunk, and even the arms were dispersed considerable numbers of soft vesicular pustules of elliptical shape, with a red areola at the base, and an elevated round summit, containing whitish opaque matter, which appears to be immediately beneath the cuticle and on the surface of the *cutis vera*. All these vesicular pustules are distinct, not coherent. The large reddish blotches are to-day round, elastic, and distinctly fluctuating ; but in them the matter is evidently contained beneath the *cutis vera*, and not, as in the small vesicular pustules, beneath the epidermis.

He continued in the same state, and died the same evening about half-past six o'clock.

The body was inspected on Monday, the 21st November, at one P. M., and disclosed the following appearances.

A deposit of purulent matter upon the left side of frontal bone beneath the pericranium ; a great deal of serous fluid in the subarachnoid tissue ; a considerable quantity of serous fluid in both ventricles, about three ounces in each ; both very much dilated, especially at the posterior cornua.

Old adhesions were found connecting the whole of the upper, middle, and back part of the lung to the pleura.

In the apex of the right lung, towards its back part, was found a cavity as large as a hen's egg, approaching very near the surface, and which burst in the course of being taken out. This cavity contained a quantity of curdy purulent matter, broken down lung, and bloody serum, all exhaling a most offensive odour. The whole was bounded by a cyst of false membrane, separating it from the surrounding lung. The surrounding lung itself was much firmer, than natural, granular, and solidified ; and when pressed discharged a large quantity of bloody serum. This solidification was confined to the upper lobe and the upper part of the middle lobe. The left lung presented at the junction of the upper lobe with the lower a degree of hepatization, but much less.

In several of the veins were found adherent clots.

The other organs were healthy. Incisions were made through several of the large soft prominent tumours on the extremities ; and they were found to consist of portions of thick curdy or putty-

like purulent matter, situate completely beneath the skin, in the subcutaneous cellular tissue, and surrounded there by a sort of imperfect cyst.

The case now detailed presents many peculiar circumstances which deserve particular attention. We observe, at least, three orders of phenomena.

In the *first* place, the man complained of painful tenderness all over his body; the nights were disturbed and restless; he had coldness and shivering; he suffered from obstinate diarrhoea; and lastly, sensibility and consciousness were greatly impaired, delirium or rather typhomania took place, with great debility of all the movements; and the respiration was extremely rapid and laborious.

In the *second* place, we find deposits of thick curdy purulent matter, like atheromatous matter, disseminated over the person in the subcutaneous cellular tissue. The time at which these purulent tumours first began to be formed could not be ascertained. They were in a state of considerable advancement or even maturity at the period of admission; and though it was clear that such collections must have taken some time in being formed, we had no means of determining either the time occupied in this process, or in what mode they at first appeared. Is there any natural disease in which deposits so multiplied are formed?

In the *third* place, the eruption of vesiculo-pustular bodies on the skin covering the left side of the jaw was a phenomenon so singular in character, that it unavoidably demands particular attention. These bodies bore no resemblance to any eruption with which we are acquainted. At first sight it might have been thought that they bore some resemblance to the soft tubercles of *sycosis*; but from these they differed both in size, in appearance, in situation, and in disposition. The tubercles of *sycosis* are usually reddish, not broad or flat but round, and are distributed uniformly over the chin or scalp, not aggregated, as these were, in one broad patch on the left masseteric region.

In the *fourth* place, the eruption of vesicles which took place on Friday, and were not visible before that, constitutes a circumstance, so far as I am aware, peculiar and isolated. These vesicles resembled neither small-pox pustules nor vaccine vesicles, nor any of the secondary eruptions of syphilis with which I am acquainted. They were too numerous to be referred to the head of *rupia*, the only eruption to which they could be said to present any similitude, nor did they seem to affect the *cutis vera* so deeply or extensively as that eruption is observed to do. From ecthyma also they differed, in being more superficial, and presenting more of the vesicular character. They, on the other hand, were in all respects similar to the pustules described by Dr Macdonnell, as occurring in the person of Patrick Wallace.

This eruption, on the other hand, and also the purulent deposits, appeared to be the effects of a morbid poison. Similar to these effects, their appearance was preceded by a train of morbid phenomena, indicated by great constitutional disturbance, and much disorder of the vascular and nervous system, as well as the alimentary canal. The period preceding the appearance of the purulent deposits might be regarded as a latent period, or a period of incubation, during which the poison was in the process of being circulated with the blood, and producing its usual effects on the system and on the different textures. The eruption of vesiculopustular bodies on the skin of the person may be regarded as a further or later effect of the same cause, or a subsequent product of the operation of the poison.

It was principally the eruption of these bodies on the 19th, with the formation of the purulent deposits, that led me to infer that the case was one either of acute glanders or acute farcy in the human subject. Previous to the appearance of the vesiculopustular eruption, I had not been able to form any definite opinion on the nature of the case. At one time, I thought it resembled typhous fever; at another, gangrene of the lungs; but from both of these diseases it differed in many respects. When the eruption appeared on the 19th, the idea presented itself to me, that it was similar to farcy, and that, had there been a discharge from the nostrils, I would have called it glanders. This opinion I was just on the eve of announcing, when, on turning round, I found an eminent professional friend waiting for me to inquire concerning a patient; and the conversation that followed put the matter out of my recollection till evening, when, on talking on the case to a friend who had seen it, it again occurred to me that it might be glanders; and he, who had seen one case in London, stated, that it closely resembled the appearances observed in that case, excepting in the absence of the discharge from the nostrils, which in that case also was observed.

I myself laboured under the disadvantage of never having seen a case of glanders in the human body; and all my knowledge of the subject had been obtained from perusing the papers of Dr Elliotson, and the elaborate memoir of M. Rayer, with some sketches in the periodical writings of the day. From my recollection, however, of the appearances presented by the cases recorded by these authors, it appeared to me that the case was sufficiently similar to these, to admit of being referred to this head; while its peculiarities did not allow it to be referred to any other disorder. These views were, at least, corroborated by the subsequent course of the disease, and by its fatal termination, and also by the light thrown on its nature by inspection of the body. The collections of putty-like thick purulent matter which were found in various parts of the body, the eruption, the gangrenous abscess

at the apex of the right lung, and the firm coagula found in the veins, seem to leave little doubt that the disease of this patient must have been produced from the cause now specified.

With regard to the gangrenous abscess in the right lung, it may be argued that this is not a very common circumstance recognized in the lungs of patients destroyed by glanders. It must be admitted that it is not common; and that a much more common state is bronchial inflammation, and circumscribed inflammation of the substance of the lungs, similar to lobular inflammation of these organs, or small abscesses disseminated through their substance. This circumstance, nevertheless, though not frequent, has been seen to take place. The same event appears to have taken place in the 14th case (Chap. IV.) recorded by M. Rayer, and which is, indeed, originally given by Bayle in the *Revue Med.* Tome ii. 1826, p. 70. But though no parallel case in this respect could be adduced, it would not form a clear argument against the conclusion, that the disease of Dixon was farcy or glanders. An animal poison which produces mortification in one texture, as the skin or cellular tissue, which we positively know that of glanders does, may equally well produce the same process in another, as the lungs.

It may be, on the other hand, said, that the absence of two symptoms so important as the discharge from the nostrils, and the gangrenous inflammation of the face, is at variance with the idea that the case now described is one of glanders. It cannot be denied, that, in the majority of the cases of glanders in the human subject hitherto recorded, a discharge of glairy muco-purulent fluid proceeding from one nostril has been observed; it has also been ascertained that this discharge is connected with a pustulo-tubercular degeneration of the mucous membrane of the nasal cavities, and eventually with the same state of the mucous membrane of the larynx; and in many cases, if not all, it has been remarked that the presence of this discharge was accompanied or followed by erysipelatus inflammation of the face or side of the nose, proceeding most rapidly to gangrene. Upon this point, however, the testimony of M. Rayer is decided as to the nasal discharge and the pustulo-tubercular eruption forming the great diagnostic mark of difference between glanders and farcy. "The existence," he says, "of a nasal discharge, and of a pustular eruption in the nose, and sometimes in the larynx, form accurate distinctions between acute glanders and farcy." This conclusion is amply confirmed by several of the cases adduced by M. Rayer, but more especially by the third, fourth, and fifth cases recorded in the third chapter of his memoir. In these cases the phenomena presented were, after pains in the body and limbs, fever, and delirium, the formation of boils or subcutaneous abscesses, and an eruption of vesiculopustular eminences over the person, not unfrequently with inflam-

mation or abscesses of the lung. The external cutaneous eruption, indeed, resembled what is popularly denominated the button farcy, that is, the pustular farcy. Farcy, indeed, shows its effects principally in the lymphatic vessels and glands, on which it produces inflammation in the superficial veins, and in the formation of numerous abscesses in different regions of the body, and a pustular and gangrenous eruption on the skin. These differences are conceived to depend on the difference in the parts affected; that is, while the poison of glanders affects first the mucous membrane of the nasal cavities, and frontal sinuses, and the larynx, that of farcy shows itself in the lymphatic vessels and glands, and in the cellular membrane and skin. The poison, however, is the same in both. "In man, as in the horse," says Rayer, "acute farcy differs from glanders only in the nature of the parts affected. Farcy and glanders are morbid states produced by the same contagious poison, and differing only in their seat."

Views very similar of the relation between the two disorders, if two distinct disorders they can be called, are taken by Dr Elliotson. When the disease appears under the form of discharge from the nostril and gangrene of the face, he regards it as glanders; and when it appears in the shape of purulent collections in the extremities, and the vesiculo-pustular eruption on the skin, he considers it as the farcy form of the disorder. Indeed, it appears that the two lesions may exist separately, or be conjoined in the same individual.

While, therefore, I am compelled, in some sense, to refer the case detailed in this paper to the head of Farcy, it seems impossible to doubt that it must have arisen from the individual having been in communication with a horse or horses which were labouring under glanders. It was ascertained that the man, who was an omnibus-driver, had been in the habit of grooming his own horses, and that in the stables where these were kept, there were, about three months previous to the date of his illness, two horses labouring under glanders. We could not, however, clearly and positively ascertain that he had been in communication or contact with either of the two sickly horses. This, however, does not form a greater difficulty to the case than occurred in the two cases first published by Dr Elliotson, viz. those of Thomas Maskall and Thomas Dixon, in the last of which Dr Elliotson ascertained that the young man, who was a blacksmith, not a shoeing smith, at Lambeth, had worked at a forge, separated from a stable where a glandered horse was kept, only by thin imperfectly united boards, and had patted the horse about the head, when it had fallen down, on the day when it was taken away to the knackers; while, in the former, he merely learnt that the person, who was a tailor, had been in a cart dragged by a glandered pony, and had helped to harness the animal. As there was no proof of actual contact in either of these

cases, and none of inoculation by glanderous matter, Dr Elliotson inferred that in both cases it was probable that the matter had come in contact with some of the acnoid particles of the forehead and face, with which, he further learnt, both these young men were affected.

The circumstance of having recourse to this idea, in order to explain the appearance of the disease in these patients, shows the extreme difficulty of tracing the transmission of the disease in any given case.

But though this case must in its present form be referred to the head of Farcy rather than Glanders, from the absence of the nasal discharge, and the gangrenous inflammation of the nose or face, it occurred to me, in reflecting on it and other cases recorded by different authors, that, had not the patient been destroyed at an early period by the gangrenous inflammation of the lungs; in other words, had life been sufficiently prolonged, the nasal discharge would have taken place, and the mortification of the face would have followed. My reason for entertaining this opinion is the following.

The muco-purulent discharge from the nostrils is manifestly connected with, if not caused by the tuberculated degeneration of the Schneiderian membrane. It seems difficult to conceive that this pustulo-tubercular degeneration can be other than a disorder somewhat chronic, that is, it must take some time before it commences, some time before it is fully established, and a considerable time before the discharge becomes so profuse as it is usually observed to be. It appears, that, in the case of Thomas Dixon, given by Dr Elliotson, the space of two months elapsed between the time at which the individual was exposed to the contagion and the occurrence of the gangrene of the face. He was in comparative good health on Tuesday the 23d June 1839. Next morning the face was red, swelled, hot, and painful. He was brought to the hospital very ill on Thursday evening the 25th; and he seems to have died on the morning of Saturday. As it is positively stated that he felt himself quite well on Tuesday the 2d, it is quite clear that the discharge had not then taken place. It was, however, very abundant on Friday. This must, therefore, have been at least seven weeks after the period of the alleged exposure to the poison of glanders.

In the case of Maskall, the red hot pimple, which terminated in gangrene of the face, appeared on the evening of Sunday the 15th of March 1829, after eight days' illness with febrile symptoms. No mention is made of the discharge having yet appeared. Death appears to have taken place on the morning of Saturday the 21st March, making the whole duration of the acute final symptoms to be six days.

From these cases, therefore, the course of which was carefully observed, and several similar might be added, it appears that the

nasal discharge is late in appearing, and that, when it does appear, accompanied as it usually is with gangrenous inflammation of the face, it very speedily destroys the patient.

In the case of John Dixon, the nostrils did not present any change similar to what takes place in glanders. But it must not be omitted to say, that, from the prejudices and clamour of the friends, the dissection was imperfect, and consequently it is uncertain whether the remoter parts of the nasal cavities were diseased or not.

Among the general symptoms of the disorder, the diarrhœa, the sweats, and the delirium and typhomania seem to be most constant. Diarrhœa seems to have attended every one of the cases already recorded, was a prominent and urgent symptom, and required the employment of remedies. In the case of John Dixon, it was particularly prominent. The fetid perspirations were perhaps not quite so manifest; but this might be owing to the late period at which the patient was seen. The typhomania was very distinct, and, indeed, gave the disease at first sight the aspect of the last stage of typhous fever. Its cause was early understood, from the copious effusion of serum in the subarachnoid tissue, and the fluid within the ventricles.

The pathognomonic symptoms, it is scarcely requisite to add, were the purulent deposits and the eruption.

These observations, I am aware, are very imperfect, and I submit them at present as the result of what occurred to me in the course of observing this disease during the few days that it was under observation, and as suggested by the appearances found on inspection of the body. It has been often doubted by many good authorities in medicine and veterinary surgery, whether glanders or farcy appears in the human subject; and by several its occurrence has been denied. After the occurrence of Dr Elliotson's cases this could no longer be matter of doubt; and the additional cases given by Rayer corroborate the evidence beyond question. As this is the first case, so far as I am aware, in which the existence of the disease was recognized during life in Scotland, I thought it proper to publish an account of it, with such remarks as might tend to elucidate the nature of the disease, and enable others to recognize it when met with.

ART. XIII.—*Case of removal of Stone from the Bladder by the new operation of Lithectomy or Cystectomy, with remarks.*

By THOMAS ELLIOT, M. R. C. S. L., Carlisle.

THE following case possesses some interest, from the circumstance of its being, so far as I am aware, the first on record of the adoption of the plan so ably advocated by Dr Willis of London

in a recent publication,* and said to have been originally proposed by Mr John Douglas, and shortly afterwards (in 1819) suggested to the late Sir Astley Cooper by the Drs Arnott.

The successful removal of a calculus of considerable size on that occasion by Sir Astley, in the mode recommended by the Drs Arnott, who attended the case with him, could scarcely be regarded as a fair test of the merits of this operation, inasmuch as the patient had, nine months previously, undergone the operation of lithotomy, and a possibility existed of the cicatrix of the prostate having been torn open, if, indeed, that gland had ever entirely healed,—a fact more than doubtful, from the presence of a recto-urethral fistula, that had remained from the first operation, and might possibly traverse a portion of the gland.

The operation, as performed by myself, deviated in some respects from the plan proposed by Dr Willis, as it appeared to me that any advantage that could be gained by external incisions so very limited as he recommends, would be much more than counterbalanced by the inconvenience that might possibly attend the introduction of the dilator, by the difficulty of securing any blood-vessel in case it were necessary, and by the additional resistance that would be offered to the process of dilatation, and to the subsequent removal of the calculus.

CASE. Thomas Irving, aged 17, stone mason, first consulted me in the month of May 1842. His general health was good, though the inconvenience that arose from the presence of a stone in his bladder was increasing. He had, however, been able to attend to his employment until a fortnight before I saw him, and stated that he could walk, and even run, without suffering. The symptoms were not severe, but, as the medical treatment to which he had been previously subjected, had failed to remove the irritability of his bladder, he was anxious to submit to an operation for the removal of the stone, with which he believed he had been affected for four months.

Having observed a slight scaly eruption on the skin, and that the urine was of an acid nature, I subjected him to a course of simple alteratives, and gave him a weak solution of the carbonate of potash in considerable quantities. As the stone on sounding appeared to me, and to my medical friends, who on various occasions saw the patient, to be of small size, they at once agreed with me on the fitness of the case for a trial of the operation of lithectomy; and the patient, together with his father, willingly consented to its adoption, on its being explained that it was comparatively, if not entirely, free from danger.

* On the Treatment of Stone in the Bladder by Medical and Mechanical means. By R. Willis, M. D., of the Royal College of Physicians, Physician to the Royal Infirmary for Children, &c.

I accordingly procured from Mr Weiss of London a dilator with stop-cock and syringe, as described by Dr Willis, and proceeded on 29th of July, after the exhibition of an enema and an opiate, to operate as follows, in the presence of Drs Jackson, Oliver, James, Atkinson, my brother Dr William Elliot, and pupil Mr Fleming.

Operation.—The grooved staff was introduced, and the stone felt and heard. The patient was then secured in the same position as for lithotomy, and the different steps were precisely the same as in that operation, until the prostate and membranous part of the urethra were exposed. The latter was opened close to the prostate, and divided cautiously towards the bulb, by carrying the knife along the groove of the staff, till an opening was made of sufficient size. The staff was then withdrawn, and the point of the forefinger of the left hand served as a guide for the introduction of the dilator, which, having been previously well greased, was passed along without any difficulty. A little warm gum-mucilage was next slowly injected into the instrument, until the patient slightly complained of the feeling of distention. On removing him from the table to the bed he complained of a strong inclination to make water, which was found to arise from the dilating part of the instrument having slipped into the bladder. It was emptied, partially withdrawn, and, when fairly within the neck of the bladder, again distended. In this position it was secured by attaching a long tape to it, and around the patient's foot, which again was fastened to the bed post.

The patient did not complain above his breath during the operation, nor lose more than two or three drachms of blood. Another opiate was now administered.

In three hours time, a few teaspoonfuls of the mucilage were again thrown into the dilator until the patient complained. Urine had passed freely along that part of the tube which communicated with the bladder. He slept occasionally during the day, and the pulse was natural.

30th, at 8½ A. M. Going on well; thought the distention as much as he could bear.

At 1 P. M. Slight sympathetic tenderness over the whole of the abdomen; pulse 104, irritable; uneasy from the distention; pain of perineum on coughing; tongue clean and moist. Gave him an opiate, and sent word to my medical friends, who met me at 3 P. M. I then, in their presence, emptied the dilator, and withdrew it, at the same time passing my left forefinger along it into the bladder. I immediately felt the stone, which was of small size, and in shape resembled a coffee bean, being about four times its size. It was removed with the scoop and finger. The prostate was well dilated, and would have allowed the removal of a

calculus of more than an inch in its shorter diameter. The uneasiness of the abdomen and perineum disappeared on the withdrawal of the dilator. A lithotomy tube was then left in the wound.

At 12, *med. nocte*. Urine had passed freely; pulse 96; tongue moist; no pain; had slept well. Ordered a dose of castor oil.

31st. Bowels not moved; had an enema; appetite good; says "he never felt better."

August 1. A M. Complained of slight uneasiness, which disappeared on the removal of the lithotomy tube; going on well. At 10 P. M. was able to retain his urine, and could expel it by the wound.

At midnight passed about half-a-cupful by the natural passage. He was directed to lie on his right side, to favour its passage along the urethra as much as possible.

2d to 11th. Going on well; bowels regular; tongue clean; no constitutional disturbance; urine escaped freely both by the natural passage and wound; deposit of mucus in it; no pain; each night had taken a composing draught.

12th. Had a rigor.

13th. Complained of pain along the left spermatic cord.

15th. Left testicle swollen.

20th. Unable to void his urine by the natural passage at all; *Ardor urinæ*, and *gonorrhæa præputialis*.

24th. There was a discharge of a teaspoonful, or two at the most, of dark brown fluid, partly by the urethra, and partly by the wound. None of it had been kept. We supposed it to have been from a small abscess in the neighbourhood of the bulb, from the circumstances of the rigor on the 12th, and of no urine having passed along the urethra since the 20th, though it had escaped freely by the wound.

For a few days he had laboured under constitutional disturbance of a slight description, and for the first time since the operation had not rested well at night. After the escape of purulent matter, however, on 24th, he rapidly improved, and was able to walk out before the end of the month, occasionally calling at the surgery, and at other places still more distant from his home. For a short while, a few drops of urine occasionally escaped by the perineum when he was making the last usual efforts to expel it, until the wound finally closed. He has followed his employment (which is now that of a pipe-maker) from the 3d or 4th of October, and has improved much in appearance, being considerably stouter than before the operation; and he says he would willingly submit to it again if afflicted with the same complaint.

I may mention that the patient was seen at different times by

Dr Lonsdale of Edinburgh, and by Messrs Bowman, Kerr, and Linton of this city, besides those present at the operation.

Remarks.—1. It will always be advisable before hand to dilate the urethra and neck of the bladder as much as possible, by the introduction of bougies gradually increased in size, both to facilitate the passage of the dilator, and to accustom those parts to the presence of a foreign and irritating body.

2. Before operating, as well as during the process of distention, an opiate operates advantageously, by diminishing the sensibility, lessening any chance of shock, and relaxing the part.

3. The grooved staff should be large, and pressed against the perineum, not hooked against the pubis, as in lithotomy, care being of course taken to prevent its escape from the bladder.

4. The external incisions I would recommend to be free, since, if the prostate were unfit to undergo the process of dilatation, either from great rigidity, as is frequently found in old subjects, or from morbid irritability,—the operation could be at once completed by converting it into lithotomy. It will be unnecessary to repeat the reasons before given, for the preference afforded to this plan of proceeding.

5. The form of the dilator sent to me by Mr Weiss might be improved by making it cylindrical, and not tapering towards each end. There would thus be no risk of its slipping from its position. The signs of its being properly placed are the feeling of distention and immobility. When it slips into the bladder, (as happened in this case, on removing the patient from the table,) the instrument can be pushed inwards towards the bladder, cannot be withdrawn, the tube is very moveable in all directions, and the patient experiences *tenesmus vesicæ*, without any feeling of distention. It would be better if the dilating part of the instrument was of sufficient length to appear in sight, as the operator would be not only certain of its position, but able also to judge of the degree of tension when injecting the fluid,—a much safer criterion than trusting to the feelings of the patient, who might possibly submit without complaint to a pressure that would prove injurious. The instrument would be also improved by attaching a small stop-cock to the urine tube, and another to the tube that communicates with the dilator, as that which screws into the syringe is apt to slip when left in the tube. If the piston of the syringe was graduated, and the dilator perfectly water-tight, the surgeon would be able to judge exactly of the degree of distention of the prostate by the quantity of the fluid injected; and this would at once enable him to remove the instrument as soon as the dilatation was complete.

6. The length of time requisite for dilating will, of course, vary according to the resistance of the prostate and degree of force used; but I would strongly urge its being done at intervals, for, say

quarter of an hour at a time, as less likely to cause irritation than if continued for a period of 30 or 40 hours, as has been mentioned.

When the dilator was withdrawn in this case, two fingers could be introduced with the greatest ease along with the scoop.

The instrument, when fully distended, measures $4\frac{1}{2}$ inches in circumference, and is about the size of a hen's egg; and a stone of the same dimensions might have been easily extracted.

Though twenty-five hours elapsed before the removal of the stone, it could have been as easily effected, and the dilation must have been as complete, at the end of the third hour, since no additional fluid was thrown in after that time. This period was allowed to elapse, as I certainly did not expect to meet with so little resistance, and be able to complete the operation in so short a time. The alterations in the length of the dilating part of the instrument which I suggested above, would have at once prevented this, nor would it have happened, could I have been certain that none of the fluid had escaped where the stopcock is inserted into the tube, and by that means known that the distention was kept up.

Though impossible to form a correct estimate of the operation from one case, I would be inclined to give a decided preference to this plan over that of lithotomy.

The patient, from beginning to end, could never be said to be in danger, as any hemorrhage that might have taken place during the operation could have been easily controlled. The presence of the dilator effectually prevents any oozing, as well as the injurious contact of the urine with the raw wound. There was no chance of shock, no risk from peritonitis, infiltration of urine, inflammation of the veins of the neck of the bladder, nor any of the grave sequelæ that too often supervene on the operation of lithotomy. The only unfavourable circumstances that occurred during the progress of the case, were the formation of a trifling abscess, as previously mentioned, and the existence for a few weeks of a small fistula, which would barely admit a crow quill. The former would probably never have occurred, had not the pressure, as recommended, been uninterruptedly continued; and the latter, which healed up soon on his taking exercise and gaining strength, is of too frequent occurrence after lithotomy, to deserve more than a passing notice.

Difficulties, which have been already stated, may occur, viz. great irritability or rigidity of the prostate. In such cases no time has been lost, if the preliminary incisions for lithotomy have been resorted to, and the prostate may be at once partially divided, and the stone removed. But is this step advisable, or even justifiable where the dilator can be employed? I should say not. The loss of a few hours, for the purpose of dilating, is, of course, of no moment, if the danger to the patient is lessened, or even removed and whatever be the size of the stone, if the distention has been

complete, it will be perfectly accessible to the most efficient crushing instruments, and its perfect and immediate removal rendered a matter of certainty.

This conclusion, which Dr Willis anticipated, is fully warranted by, and could have been realized in the preceding case; and his able advocacy of this operation, with his bold and judicious estimate of its merits, as compared with lithotomy and lithotrity, entitle him to the highest esteem of his professional brethren, and to the warmest gratitude of every sufferer whom the operation may relieve.

Carlisle, November 1842.

ART. XIV.—*Statement “on the Anatomical Relations of the Blood-Vessels of the Mother to those of the Fœtus in the Human Species.”* By JOHN REID, M. D., &c.

In a paper “On the Anatomical Relations of the Blood-vessels of the Mother to those of the Fœtus in the Human Species,” printed in the 146th Number of this Journal, I have made a remark which I am anxious publicly to correct. It is mentioned in a footnote, that I believe that the representation of the manner in which the foetal placental vessels are distributed, “as given by Wagner in his *Icones Physiologicae*, Fas. 1, Tab. XI. Fig. 2, and stated to have been furnished by Weber, is far from being correct.” I had lately the satisfaction of visiting Weber, who not only very kindly showed me all his preparations, but gave me some portions of his beautifully injected placenta. I am now perfectly satisfied that the representation he has given of these vessels is perfectly correct. In calling in question the correctness of Weber’s representation, I was at the time under the impression, from an examination of the engraving mentioned,—which, however, greater attention paid to Fig. 3 might have corrected,—that it was meant to imply, that the corresponding artery and vein did not run in the same sheath, but coiled about sometimes apart from each other,—for, being taken from a dried preparation, the sheath or villus in which they are enclosed is not represented,—and it was this supposed error which alone led me to make the criticism mentioned above. I had not at this time seen Wagner’s *Lehrbuch der Physiologie*, in which a detailed description of this structure is given. If I had supplied in Fig. 2, by the aid of my imagination, the walls of the villus surrounding the convoluted artery and its accompanying vein, I would not have questioned its accuracy, for I was maintaining, as the result of my own observations, that they were inclosed in the same sheath. I make this statement, not so much from the importance of the subject, for it relates merely to a minor question of anatomical detail; but having erroneously called in question, chiefly from a misapprehension on my part, the accuracy of an observation made by a most distinguished anatomist and most estimable man, I am anxious to correct it.

PART II.

CRITICAL ANALYSIS.

ART. I.—*On the Curative Influence of the Climate of Pau, and the Mineral Waters of the Pyrenees, on Disease, with Descriptive Notices of the Geology, Botany, Natural History, Mountain-Sports, Local Antiquities, and Topography of the Pyrenees, and their principal Watering places.* By A. TAYLOR, M. D. London, 1842. Pp. 342.

THE blessing of almost universal peace, among the many benefits in its train, affords to the invalid the choice of a residence in the climate pronounced to be most conducive to his recovery. The most salubrious spots of Italy, Germany, France, have long been open to every sufferer from chronic ill-health, whose limited means have not confined him to his native soil. Yet even now, with the thirtieth year of this all but universal peace near at hand, the medical profession, and still more the public at large, but begin to obtain anything like an exact knowledge of the comparative merits and demerits of places celebrated for the cure of diseases, as respects their particular effects on this, that, or the other set of maladies. The foundation of this most serviceable department of medical knowledge is indeed already laid under the most favourable auspices, but the continuance of peace is indispensable to the carrying of it to such a degree of maturity and perfection, as shall put it out of the reach of future political contingencies. For it is beyond dispute that what little knowledge had accumulated at different times in this country during the two preceding centuries, as to the distinguishing salubrity of different celebrated spots on the continent of Europe, invariably became dispersed, and rendered of no avail by each succeeding war, so that, at the general pacification in 1815, the annals of medicine at home present nearly a total blank as to this subject, with the trifling exception of some imperfect details of the more celebrated continental mineral waters.

The work before us has suggested these few reflections. It is

on the Curative Influence of the Climate of Pau and of the Pyrenean waters, together with such notices respecting these localities as may prove of interest to the visitor. The author, Dr Taylor, is an English physician, resident in Pau, who has brought to the execution of the task, which he has undertaken, varied acquirements and much commendable industry.

He treats at length of the climate of Pau, and of the objects of interest connected with the place, and gives a full notice, besides, of the following Pyrenean waters:—Bagnères de Bigorre, Capbern, Barreges, St Saveur, Cauterets, Eaux Bonnes, and Eaux Chaudes.

Dr Taylor's account of Pau includes a description of the place, meteorological details illustrative of the climate; inquiries respecting the health of the native population; the effects of the climate of Pau on English strangers; the diseased states ameliorated by the climate; those aggravated by it; and a comparison of the climate of Pau, with that of Rome, and that of Nice, in reference to health and disease.

Of these in order,—Pau is about twenty miles distant from the nearest of the Pyrenean chains, and commands a view of these mountains in a range of at least sixty miles. It was the capital of the ancient province of Bearn, and is now the chief town in the department of the Lower Pyrenees. It is situated on the Gave, a tributary of the Adour, which, our readers will remember, enters the sea at Bayonne; it is 125 miles south of Bordeaux, and seventy miles east of Bayonne, which latter place is also the nearest approach of the sea to Pau.

From Bordeaux the journey to Pau may be accomplished even by a delicate person in two or three days, and from Havre to Bordeaux there is a steam-conveyance three times a month, while if this should be discontinued, which Dr T. thinks not unlikely, there is another route by steam to St Malo from Southampton, and thence by a short land-journey to Nantes, and so by steam, three times a month to Bordeaux.

Pau is a well-built town, and contains about 14000 inhabitants. The manners of the people still retain traces of the polish belonging to a place once the seat of a considerable provincial aristocracy, though comparatively few families of this stock are now numbered among its inhabitants. In lieu of this change the resort of visitors to the place, within the last twenty years, has introduced many improvements conducive to greater comfort, among which are cited as specimens, carpets to the rooms, carriages to hire, and foot-pavements. There is an English place of worship in the town; well supplied means of education for families; and a considerable public library. The theatre is on an inferior scale, and in most respects, there is a deficiency of public amusements, but

there are great facilities for intercourse in private society. It is an established custom for the new-comer, who desires to enter into society, to call on those who have already fixed their residence in the town. There are excellent means of exercise, whether in a carriage, on horseback, or on foot. The principal promenade is the Park, a terrace a mile long, overlooking the river, and perfectly dry even in winter a few hours after rain has ceased.

The season at Pau commences in the beginning of September and ends in the beginning of June, the intensity of the summer heat seldom setting in before the middle or even the end of June.

There is a considerable number of lodgings in Pau available for strangers at a reasonable rate; every thing necessary for a family being supplied except linen and plate, both of which may be hired in the town.

Dr Taylor's observations on the meteorological details of the climate of Pau open with the following paragraph.

"Any person who has had experience in the treatment of disease, and who has seen similar diseases in similar temperaments, under different geographical conditions, must confess that the beneficial effects of any one climate over another, are not always in unison with *a priori* conclusions drawn from facts indicated by the usual philosophical instruments. Still, if not always unerring guides, these indications at least help us on the road, and where they are deficient in accounting for the results, they lead us in search of auxiliary causes, and thus enable us to arrive at some knowledge of the peculiarities of climate, and their influence upon the human frame." —P. 39.

There can be no dissent from the sentiments just expressed; here, as in most other parts of practical medicine, it cannot be determined, from the mere consideration of general grounds, what course should be adopted; every conclusion drawn from *a priori* views must be subjected to the test of experience, before any just confidence can be reposed in it; or general principles and general facts must be employed, not so much to settle what will be beneficial in the cure of disease, as to suggest such and such methods for trial—cautions in proportion as the foundation of each is less simple or less certainly free from sources of embarrassment. The determination of the effects of change of climate on particular diseases is a task beset with many causes of fallacy, requiring much time and sedulous attention to bring out trustworthy results.

"It is not merely a climate possessing a high thermometric and barometric standard, which can or does afford a panacea for all those diseases, for the relief of which people fly from cold and moist countries. The varieties of atmosphere are so different from local circumstances, in different places in the same latitudes, that an intimate knowledge of the peculiar details, as they operate beneficially or otherwise, is required, in conjunction with general meteorological

data, to fix a rule as to the medical fitness of any climate as a remedy, and thus experience comes in aid of philosophy."—Pp. 40–41.

The mean annual temperature of Pau, according to our author, is $56^{\circ} 16'$, which estimate exceeds that in Sir James Clark's table something more than one degree.

"The mean annual temperature, therefore, of Pau is nearly 6° higher than London, and $4\frac{1}{2}^{\circ}$ higher than Penzance; it is about 3° lower than Marseilles, Nice, and Rome, and 17° lower than Madeira. In winter it is $3\frac{1}{4}^{\circ}$ warmer than London, and $1\frac{1}{2}^{\circ}$ colder than Penzance, 5° colder than Nice and Rome, and 17° colder than Madeira. But in spring Pau is $5\frac{1}{2}^{\circ}$ warmer than London, $4\frac{1}{2}^{\circ}$ warmer than Penzance, and $2\frac{3}{4}^{\circ}$ colder than Marseilles and Rome, and 8° colder than Madeira."—P. 62.

The mean annual temperature, as given in the above account, is drawn from observations furnished by M. Mermet, Professor of Natural Philosophy at the Royal College of Pau, and therefore we are bound to suppose, though it be not expressly mentioned, refers to the temperature by night as well as by day. It would have been more satisfactory, however, had M. Mermet's method of observation been distinctly stated, for we confess, that our first inspection of the tables of temperature, as they show a higher average than those in Sir James Clark's work on Climate, led us to believe that the same rule of observation had been adopted throughout which is admitted in table third, namely, to calculate the mean temperature of the seasons from observations taken three times daily, viz. 9 o'clock A. M., 1 o'clock P. M., and 5 o'clock P. M.

We are satisfied, on a more attentive examination, that M. Mermet did not follow this rule, by finding that the results in the two tables for corresponding periods of the same year do not coincide. We have no reason to doubt the accuracy of M. Mermet's tables; as far as we have the means of judging, they seem to be constructed on the proper plan. But, as no explanation of the method adopted in the tables is given, except that above-mentioned as attached to table third, we fear that Dr Taylor's readers will be apt to fall into the same error with ourselves, and think that one principle, and that an erroneous one, prevails throughout. As we do not remark that the accuracy of the meteorological observations made in general with a view to the improvement of our knowledge of climate, increases with their increase in number, it may not be out of place to notice how erroneous an estimate of the mean temperature of the twenty-four hours would be obtained by observations made as above at 9 A. M., 1 P. M., and 5 P. M. We are aware that Dr Taylor designed this table merely for the satisfaction of the invalid, as indicating the temperature of what may be termed the invalid's day—and if confined to this purpose, it is a useful table. But as such a table is very apt to be taken.

inadvertently as a standard of comparison with other climates, we think it worth while to remark, that it has been ascertained that in the middle latitudes of Europe, the mean annual temperature about nine o'clock in the morning gives the mean annual temperature of the twenty-four hours, which is given also by the mean annual temperature about eight o'clock in the evening, and that the mean hour of maximum temperature is about 2 P. M., and that of minimum temperature about 5 A. M.*

It is plain, then, that if the temperature at 1 P. M. approaching to the greatest heat of the day, and that at 5 P. M., three hours before the hour of evening-mean temperature be added to the temperature at 9 A. M. the hour of morning-mean temperature, the reduction will afford a temperature exceeding the true mean of the twenty-four hours by the joint excess of the one o'clock temperature, and the four o'clock temperature above the nine o'clock temperature. Perfect accuracy in meteorological observations can hardly be expected from those who, like medical men, are engaged in other distracting avocations; and, indeed, those contained in medical works cannot be regarded as of higher authority than approximations to the truth. It is of importance, however, to remark, that the embarrassment arising from imperfect observations is greatly diminished by a particular statement of the plan on which the observations were instituted. We would only observe farther on this head, that it surprises us to see so little use made in the observations of amateur-meteorologists of so simple an instrument as Rutherford's self-registering thermometer, by which, with less trouble than is given by two or three daily observations with the common thermometer, a much greater range of facts as to temperature may be obtained.

The daily range of temperature at Pau, according to Sir James Clark, is $7\frac{1}{2}^{\circ}$.

In those winters in which an unusual intensity of cold occurs in the middle and southern parts of Europe, Pau does not escape sharing in the descent of the temperature—yet, as the table shows, by no means in the same proportion as most other places. It appears that the thermometer has been observed at Pau as low as 13° Fahrenheit, or 19° below the freezing point, and that the winter seldom passes without a few days in which snow falls, and in which some frost occurs. The snow, however, seldom lies above a few hours, and the frost is usually of short duration.

What renders the climate of Pau more genial to the invalid than its mere temperature might indicate, is the almost total absence of wind. On this point Dr Taylor quotes the following passage from Sir James Clark's work. "Calmness, for example,

* See Report on Meteorology by Professor Forbes. Reports of the British Association, 1831-32.

is a striking characteristic of the climate, high winds being of rare occurrence and short duration." And Mrs Ellis bears testimony to the same fact in her "Summer and Winter in the Pyrenees."

This absence of high winds in a place adjacent to a chain of mountains so lofty as the Pyrenees, naturally surprises one at first, nor is it quite certain that meteorological science can as yet afford a satisfactory explanation. No doubt Pau is sheltered on the north, on the west, and on the south, by elevated grounds, yet the shelter of these inconsiderable eminences seems inadequate to account for this immunity from wind. Our author says on this subject, "The north wind is thus (by the Landes of the Pont Long) directed into currents, which being attracted by the lofty mountains to the south, pass at an elevation considerably above the town: so that the clouds may be often seen quietly sailing onwards when the leaves are unmoved on the lower level."—P. 23.

We do not altogether subscribe to this mode of stating the explanation; yet indisputably something must depend on the currents being directed into higher regions than that on which the place stands, by the height of the wall of mountain presented by the Pyrenees, over which the currents must curve with the centrifugal force acquired in a wide vertical circle.

"The worst weather at Pau," Dr Taylor says, "is from the west and north-west. The east and south-east winds, from which invalids suffer so much in this country, are scarcely felt, except in bringing dry and warm weather."—P. 23.

We should like further evidence of the good weather brought by the east wind; and we suspect the following passage indicates that the east wind, though dry, as it often is with us in spring, is not very favourable to invalids even at Pau.

"The west wind, which brings rain, does not bring cold with it. Indeed, it has been universally remarked, not only by medical men, but confirmed by the consoling experience of persons suffering from coughs depending on tuberculous or acute bronchitic irritation, that what is called bad weather, viz. cloudy and rainy weather, alleviates their symptoms. This is clearly enough visible in the diminished pulse, lessened cough, and increased feelings of *bien-être*. The best wind is the south-west, as the same good qualities of weather are found as in the west, without the inconvenience of rain."—P. 45.

A good deal of rain falls at Pau. "Thus, for instance, 27 inches of rain fall annually in London, and from 36 to 40 inches or more in Pau, but the number of rainy days is, according to Sir James Clark, 109 at the latter place,* and 178 in London. The rains in Pau and neighbourhood fall in large and sudden quantities.

* Clark on the Sanative Influence of Climate, p. 189.

and frequently towards and after the setting of the sun, and the soil is so absorbent, and the natural drainage so good, that there are few days in which the healthy may not pass three or four hours in the open air, and on which even the invalid, well clothed, may not generally take exercise in the middle of the day."—Pp. 43–44.

We would remark on this passage, that 27 inches is a very high estimate for London, which is seldom rated above 20 inches, and certainly should not be rated above 25 inches.

Notwithstanding the quantity of rain at Pau, "the air," says Sir James Clark, "is remarkably free from moisture, as indicated by the hygrometer."

"We may also observe that the quantity of rain indicated by the udometer, as having fallen in any one place, does not necessarily determine the character of its climate as to humidity. This is remarkably the case with Pau, where the rain-gauge and the hygrometer are much at variance, not only absolutely in so far as Pau is concerned, but relatively to other places. For instance, last summer, when great quantities of rain fell in the south-west of France, as well as over great part of Europe, the hygrometer at Pau did not show a high range of scale, varying from 70° to 85°; while at Bagnères-en-Bigorre, thirty-six miles from Pau, further from the sea, and consequently from the bad-weather-quarter, it showed an almost permanent range of 20° to 25° higher on the same scale.

"There are some circumstances although familiar, which we shall give, as illustrating the peculiar absence of free communicable humidity in the atmosphere at Pau. Although considerably more rain falls in Pau than in London and in some other situations in England, yet from the absorbent nature of the soil, and from some peculiar electric state of the atmosphere (for the barometer, during some of the winter and spring months, most strangely rises on the approach of rain, and falls upon that of dry weather), the ladies, even during a continuance of rainy weather, find that their hair, living hygrometers highly sensitive to an overcharged state of the atmosphere, retains the curl much better than in England. Indeed, so much is this the case, that some who in England were obliged to wear the hair, *en bandeaux*, find that it now curls without effort. Another familiar proof of the deficiency of free moisture in the atmosphere, may be given, viz. that steel articles of furniture are found little affected with rust, even in unoccupied houses, nor do the walls of the latter show marks of damp."—Pp. 42–43.

The absence of humidity in the air, notwithstanding the abundance of rain, and the frequent rise of the barometer on the approach of rain, are circumstances in this climate of extreme interest to the meteorologist, to whom some farther particulars on these heads would have been most welcome. It is, however, much more easy to apprehend why the hygrometer should be little affected in a climate marked by much rain, particularly where the rain comes, not in continued moderate falls, as in rainy days, but

in sudden heavy showers of short duration, than to imagine why the barometer, contrary to the common rule, should rise on the approach of rain.

If the formation of clouds in the upper region of the atmosphere be accompanied with an augmented tendency to evaporation at the surface, it is not difficult to believe, that the sudden precipitation of large quantities of water from the same region, which must depend on the unusually rapid formation of clouds, should be attended also with a like tendency to great evaporation at the surface, which is the same thing as dryness of the air in that lower part of the atmosphere.

Upon the second circumstance above-mentioned, it would be a waste of time to speculate without further particulars; and, indeed, the account above given of it, does not clearly prove it to be a peculiarity in the climate of Pau, as it seems on a superficial view. It is well-known, that when a fall of rain attends the change of the wind from west to east, the barometer rises, so that the above-mentioned circumstance is a peculiarity only if the rain, in which the rise of the barometer takes place, be from west or south; and if this be the case, the explanation must be sought in some modification impressed on the atmosphere over Pau by the proximity of the Pyrenean mountain-wall; and we think the conception of such an effect obtains some help from the known fact of the height of a mountain being brought out greater when taken by the barometer in a high wind than in a calm, owing apparently to some condensation of the atmosphere over the adjacent plains produced by the direction of the current of air, as it ascends over the top of the mountain.

In his chapter on the health and the allied particulars of the native population, the author insists much on their general robustness. They are, as might be anticipated, a dark-complexioned race, have brown skins, small black eyes, and long black hair. They are short, broad-made, and muscular.

"The features of the young females are regular and agreeable. Their complexions and good looks, however, fade much sooner than among the males. It is difficult, after a female peasant has passed thirty years of age, to guess how old she is within fifteen years; but this decay is more apparent than real."—P. 64.

Goitre is not altogether unknown among the women; though those affected with it are chiefly from places in the neighbourhood. Our author ascribes the disappearance of the Cagots at Pau principally to the ameliorating influence of the climate; and these, he affirms, were originally strangers to the soil and to the laws. They are still to be met with in some districts of the "Hautes Pyrenees," not forty miles from Pau.

The inhabitants of Pau and its vicinity are little addicted to crime. They have less liveliness than the French in general ; they are more staid in their gestures, more phlegmatic in their whole character. " In times of political excitement and agitation they act with moderation."—P. 68.

" But this equanimity and functional quietude are not altogether confined to the native population. They gradually steal, by a slow acclimating process, on the stranger. Every Englishman who has remained some time at Pau, whether ill or well, must confess, to a certain degree of self-satisfied dreaminess, to a considerable desire for present ease and for procrastinating to the future, to a much greater extent, than upon looking back upon the past, he would, at one time, have considered possible in his own case. Indeed, so comparative an absence of organic irritation is there, usually, among the healthy, that it resembles the effects produced by a sedative. The pulse beats with a slow, soft, equable stroke, and the arterial excitement appears just sufficient to keep up functional action to the point that does not wear out the machinery."—Pp. 68–69.

No particular malady can be said to be predominant in Pau. Intermittent fevers are unknown in the town, but occur in some parts of the neighbourhood, yet at a considerable distance. Scrofulous and tubercular diseases occur but seldom as compared to the amount of the population. Rheumatism is not more frequently met with than elsewhere. Dr Taylor is very solicitous to remove the impression conveyed in Sir James Clark's work, that rheumatism is especially prevalent in Pau. He affirms that rheumatism is a name indiscriminately applied there to many different affections, and that genuine rheumatism is not particularly frequent. Bronchitic diseases are not unfrequent among the native children ; cerebral congestion and gastro-intestinal irritation are the severest maladies ; glandular and mesenteric diseases are rare.

" Except among the plethoric and sanguine, where arterial excitement runs higher, the character and progress of diseases are of a comparatively mild type. In fevers of a continued kind, the symptoms always show a greater bias to the typhoid, than to the inflammatory ; and there is a greater disposition to diseases of a congestive, than inflammatory description.

" The population of Pau and its neighbourhood has possessed a very marked exemption from those epidemic diseases which have at different periods raged in Europe."—P. 73.

The deaths in Pau do not exceed 1 in 45 annually, while in France generally the estimate is 1 in 39.

" By the last census, there were in Pau several persons, ranging from 100 to 104 years of age, and in the department also several centenaires, who are described as being still very healthy."—P. 77.

Our author goes on to draw an evidence in favour of the gene-

ral healthiness of the climate, from the hardy constitution of the cattle and domestic animals in general throughout the district, and *pro tanto*, we incline to think such evidence should be received.

Dr Taylor represents the effect of the climate of Pau on the constitution of Englishmen in health as sedative. "There is," he says, "an acclimating process, which all more or less experience, from the undefined *mal aise*, up to a more deranged state, chiefly arising from a congested condition of the liver, lungs, and brain." He regards the climate as diminishing nervous energy, lessening the force of the arterial circulation, and giving rise to venous congestion, the symptoms being languor and listlessness, not proceeding from any deficiency of strength, but from a disinclination to exertion; a sense of fulness in the head and chest, and oppression at the pit of the stomach.

We can readily believe that in such a state injudicious exposure to the sun's rays will be very apt to produce reaction in the shape of a smart attack of fever. This is warded off by avoiding such exposure, and all severe exercise for a short time, together with the use of mild aperients and some gentle treatment besides. The ultimate effect is a lowered and equal tone of health, by which the disposition to nervous excitement, such as the intense headaches of the "nervo-sanguineous temperament," and to excessive arterial action, such as periodic attacks of inflammation, are counteracted.

In proportion as the English visitor is of a more excitable habit, is the advantage to his health from the climate of Pau. Hence its climate is more remarkably beneficial in the diseases of English children, which arise generally from great arterial excitability than in those of adults; and the same advantage is observed in females as compared to males, and in the sanguine temperament as compared to the phlegmatic. Our author had before remarked, that the pulse of the natives is less frequent than that of visitors in general; but he has observed, that "the pulse of healthy persons, some time after their arrival in Pau, becomes reduced some beats in frequency, and acquires a more soft and equable character." And a corresponding change is discoverable in the pulse of invalids. Further, by a residence in Pau, the system becomes more "sensitive to the action of remedies," and those remedies which lower the circulation, such as foxglove and antimonials, must be administered in a diminished dose.

The diseases which Dr Taylor regards as particularly benefited by the climate of Pau are irritations of the mucous membranes, whether of the stomach or air passages, such as, if neglected, may lay the foundation of tubercular consumption, tubercles of the lungs in a passive state, inflammations of the bronchi and trachea,

such as public speakers are subject to, and the commencement of mesenteric disease.

He combats the opinion of Sir James Clark, that "invalids labouring under or subject to rheumatism should avoid Pau, alleging that Sir James was misled by a French authority. He cites instances of rheumatism having been benefited by the climate, and he endeavours to show that a residence at Pau is beneficial in rheumatism and rheumatic gout, whenever these are attended with vascular activity;—that, on the contrary, when these diseases occur in an atonic state of the system, the climate of Pau is unfavourable.

"The diseased state of the system aggravated by the climate is, 1. Where there is a general decline of irritability, or of the powers of life, as evidenced in atonic dyspepsia and in the long train of symptoms that accompany it, and in broken-down constitutions, from long residence in hot climates, where the functional energy of the liver has been reduced to the lowest ebb. 2. In the catarrh of old men, and in chronic bronchitis, where there is a great reduction of tone and excess of expectoration. 3. In chronic rheumatism, attended with a debilitated state of the digestive system, and complicated with atonic gout. 4. In all apoplectic tendencies depending upon passive congestion of any of the nobler organs in leucophlegmatic habits. 5. In chlorosis, from absence of functional tone, and accompanied with a congested state of the uterus. 6. In all diseases where there are congestion of the venous system and diminished nervous energy."—Pp. 94–95.

The climate of Pau stands in contrast with that of the south-east of France; the former being sedative or soothing, the latter exciting or bracing. The south-east of France is also subject to the cold winds, Bise and Mistral, from which Pau is free. Nice is protected from the Mistral; in other respects its climate agrees with that of Provence, the south-east of France. The climate of Nice is, therefore, the opposite of that of Pau, in the important point that it is unfavourable to cases requiring a lowering of the excitability, while it agrees with those to be benefited by a bracing air, such as the chronic ill-health of old people, or of phlegmatic temperaments, chronic catarrh, with copious expectoration, especially in old people, gout, chronic rheumatism, scrofula, chlorotic diseases, and in general, as Sir J. Clark observes, all those cases of torpor and relaxation which are relieved by chalybeates.

The climate of Rome makes a near approach to that of Pau. The climate of Rome, says Sir James Clark, is mild and soft, but rather relaxing and oppressive. In the stillness of the atmosphere, the climate of Rome agrees with that of Pau. The Tramontana, which is a dry, keen, irritating wind, not unfrequent during the winter, must be made a deduction from the beneficial effects of the Roman climate, as compared to that of Pau.

Though Rome, like Pau, be favourable to lowering the tone of the vascular system, it does not exert a similar sedative effect on the nervous system, there being a singular sensibility of the nervous system among the native Romans, especially the females, marked by a disposition to convulsive diseases, and a sensitiveness to perfumes. Even strangers, after a short residence, appear to acquire some share of this sensitiveness.*

Our author next devotes some fifty or sixty pages to the geology, botany, and zoology of the neighbouring country,—subjects of much interest, but which our limits compel us to pass by.

We proceed to a brief notice of what he says on the Pyrenean mineral waters.

Of the eight Pyrenean waters noticed in Dr Taylor's work, five are sulphureous, namely, Barreges, St Saviour, Cauterets, Eaux-Bonnes, and Eaux-Chaudes. Of the two others noticed, one is entirely saline, namely, Capbern; and the other place, Bagnères de Bigorre, boasts of several springs, chiefly saline, with one of a ferruginous nature.

The sulphureous springs at the five places just mentioned, with one exception, are numerous,—eight at Barreges; eleven at Cauterets; five at Eaux-Bonnes; six at Eaux-Chaudes. At St Saviour, which is but a league and a-half distant from Barreges, there is but one source. All, or nearly all these sources are thermal, those at Eaux-Chaudes, which, notwithstanding the name of the place, are, on the whole, lowest in temperature, being respectively 52° , 77° , 82° , 93° , 95° , 97° ; while those at Barreges range from 84° to 110° , or even 114° ; that at St Saviour is 92° ; those at Cauterets range from 104° to 131° , five of them being above 120° ; the chief sources at Eaux-Bonnes range from 86° to 91° , and one little used is 54° .

These hot sulphureous waters are highly stimulating, and, besides being drank, are much employed in the form of bath, particularly in diseases of the skin.

“The strong sulphurous waters ought to be administered with the greatest caution, since they cause indolent affections to pass with extreme promptitude to the acute state: they are favourable, when organic action is feeble and languid, in individuals of a loose fibre, and of deficient irritability. They are not salutary, except in chronic affections, deprived of an inflammatory character; and their efficacy is more felt where the diseases are of long standing. Also, in articular rheumatism, if the baths be taken at a period too near to an acute stage, we risk a return of the fit, or a retarding of the cure; while, at a more distant period, there is much more chance of success. It is the same, also, with darts affections of the skin; it is not the most recent, which most readily yields to this mode of treatment. We ought unequivocally to proscribe these waters in

* See p. 106; also Clark on Climate, p. 230.

all organic lesions of the heart and brain, and interdict their use to infants, and to all individuals, sanguine and irritable, and in all maladies where we can detect an active inflammatory element. Physicians will readily comprehend the motives of these contra-indications.

"And, again, with regard to diseases of the skin, for the cure of which these waters have been considered almost specific; nevertheless, they do not succeed, except, when there is great inertness in the vital properties of the skin, and when the patients are more of a lymphatic than of a sanguine temperament."—Pp. 200-201.

At Bagneres de Bigorre, twenty-two sources are noticed by our author, the temperature of which varies from 81° up to 124°, nineteen of them being above 100°.

"Table of the principal Saline Sources of Bagneres, grouped and arranged after their analogy of Medical properties.*

Stimulating Waters.	{	A little ferruginous.	{	Cassaux. Théas. Dauphin. La Reine. Petit Bain. Saint Roch.
		Scarcely ferruginous.	{	Salies. Mora. Roc de Lannes. La Guthière. Laserre. Pinac, No. 1. Petit Prieur (hot source.)
Waters which are intermediate between the two extreme classes.				
			{	Fontaine Nouvelle. Pinac (the Garden source, and that called the Ferruginous.) Grand Pré. Versailles. Pinac, No. 3.
Waters Tonic and Sedative.	{	Astringent.	Source des Yeux.	
		Mild.	{	Salut. Petit Barréges, No. 1. Carrere Lannes. Santé. Petit Prieur (cold source.)
		Emollient.	Foulon."—P. 236.	

It has been affirmed that the Capbern water contains iron; but this is denied. Its temperature is 76°.

* The waters are supposed to be taken at their ordinary temperature. It is clear that their virtues must undergo change, if the caloric, one of the elements of the action of the waters, is modified.

"Although the Capbern waters have been and are administered with good effect in all congestions of the brain, lungs, large vessels near the heart, liver, and spleen, and in chronic affections of the mucous membranes, accompanied with morbid and increased discharges, and in simulated consumption in young females, where we frequently find emaciation, hectic, oppression in the region of the chest, cough and even sanguineous expectoration, without the lungs themselves being organically affected, still, in our opinion, their proximate mode of action consists in their exciting a more vigorous circulation in the organs which have their site in the lower abdominal and pelvic regions;—in the uterus in woman—and in the hæmorrhoidal system of vessels in man;—and in both sexes an activity in the functions of renal secretion."—Pp. 268–269.

We have thus attempted to exhibit some sketch of the contents of Dr Taylor's work. Those who propose to sojourn at Pau or at the Pyrenean springs will not find the work either tedious or overloaded, though the medical reader, having no other object in view but the improvement of his knowledge of the climates fit for invalids and of the uses to which mineral waters are applicable, will be willing to pass by some of the topics on which our author has dwelt at considerable length. It cannot be affirmed, however, that any of the topics now referred to are irrelevant to the object of Dr Taylor's work.

We regard this book as highly creditable to the talents, industry, and attainments of the author. It is a work calculated to diffuse knowledge of an extensively useful kind throughout the profession. We are of opinion that he has performed his task with much fairness, and that he has carefully avoided all ground for the charge of over-partiality to the place in which he practises his profession.

ART. II.—*Lectures on the Morbid Anatomy of the Serous and Mucous Membranes.* In two Volumes. Vols. I. and II. By THOMAS HODGKIN, M. D. &c. London, 1836. Pp. 402.

THE work before us is introduced to the reader by a chapter on the study of Pathological Anatomy, a short sketch of its history, and an account of the arrangement which the author purposes following in the subsequent parts of the treatise.

It is compiled from a series of lectures which Dr Hodgkin delivered at Guy's hospital, and we consequently have the work before us divided into lectures instead of chapters.

Dr Hodgkin's name is so well known, and his authority deemed so high, that it may be thought unnecessary to mention the opportunities he has enjoyed for acquiring that practical knowledge

of his subject, which is displayed through every line of the interesting volumes before us. It appears, however, that it may be satisfactory to some of our readers to repeat the information the author has given us in his preface, that, in addition to enjoying the usual opportunities of studying pathological anatomy in London and Edinburgh, he studied under Laennec at the Hôpital Necker, and Rostan at the Salpetriere, "as well as witnessing the numerous inspections at the Hôpital de la Charité, which were at that time principally performed by Professor Andral, then a student, and laboriously engaged in collecting the mass of valuable facts which he has since published in his *Clinique Medicale*."

The office of inspector of the dead at Guy's Hospital, which was shortly afterwards intrusted to his care, and the simultaneous formation of the museum, not only threw in his way the making of several hundreds of inspections, but also the careful examination and classification of the morbid specimens.

With such opportunities our author's opinions on the subject of the lectures before us possesses a deserved claim upon the public.

Lecture 2d is ushered in with our author's reasons for selecting the morbid anatomy of the serous membranes for the commencement of his inquiry, in preference to the cellular, which is generally regarded as the basis of all. The only reason, however, out of the three which he has given, which appears at all satisfactory, is the great extent of surface which is occupied by these membranes,—the great frequency of inflammation in them,—and the ready access we have to observe the different phenomena presented by inflammation in its different stages.

The first appearance noticed in inflammation of a serous membrane is stated by Dr Hodgkin to be a dry state of it,—in fact, a cessation of its secretion.

Speaking of serous membranes generally, we have always understood that dulness or opacity was generally to be observed previous to this dry state just mentioned. Hunter distinctly mentions this, and it is described by most subsequent authors. A dry state, however, may soon follow, which has been seen and described in the human being, by Baillie, Bichat, and Knox, although our author professes never to have witnessed it.

The secretion of gaseous fluids into their cavities is mentioned as the next pathological appearance presented by the serous membranes. We agree, however, with our author in supposing that these most generally arise from pseudo-morbid changes, unless in the instances when openings communicate between the lungs and pleura, or intestinal tube, and peritoneum, or, at least, are by far more common than the secretion of air from the membranes themselves, or from the decomposition of fluid effused into their cavities. We doubt, indeed, altogether the possibility of air being secreted by a serous membrane. To return, however. If the irritation, or amount

of inflammation, which has given rise to the dry state of the serous membrane mentioned above, does not rapidly subside, serum begins to be again secreted, but with its qualities altered. It is by no means uniform in its characters, however, being in most instances superabundant in quantity. The appearance of the vascularity of serous membranes is described, as by most authors, to consist of numerous minute red points, closely and irregularly placed, and generally accompanied by small ecchymosed spots on the cellular membrane, situated behind the serous.

The researches of Villermé and Dupuytren upon the more solid effusion of serous membranes, and the changes which it undergoes from the commencement of its formation to its complete organization, are shortly stated by our author, as well as the division of the whole process into four stages, *1st*, the formation; *2d*, growth; *3d*, organization; and *4th*, transformation into cellular tissue.

Dr Hodgkin differs from Villermé in several points regarding the above process, and more especially in the relation which the different states above described bear to each other.

"I have mentioned," says Dr Hodgkin, "several varieties in the effusions met with in the cavities of serous membranes, and I would particularly recall your attention to one form which has the power of coagulating like blood.

"This, I believe, to be the most eminently plastic effusion, which, as coagulation advances, very rapidly assumes the form of tender diaphanous films, which we find separated by, and infiltrated with, a limpid but often straw-coloured serum.

"The opinion which I wish to support in opposition to Villermé, and which I have been led to form by a careful examination, undertaken in consequence of perusing the work of Villermé, is, I believe, in some points little more than a return to the doctrines of John Hunter, though not borrowed from him. I find myself perfectly in accordance with this great master of his profession in regarding the formation of the tender diaphanous films, composed of the plastic part of the effusion (the coagulable lymph of John Hunter), as the result of a process of the same nature with the coagulation of the blood. Hence, from the first they are continuous and homogeneous, even whilst they can scarcely be said to be solid; a state which they attain by the separation of serum, rather than by the aggregation of floating particles or villi. Notwithstanding their tenuity and soft and tender texture, they often form bags or pouches capable of retaining the serum. This fact appears to me to militate strongly against the idea entertained by Villermé, and sanctioned by no less an authority than that of Beclard, that the form of membrane or film is produced by the aggregation of an infinite number of minute flocculi. Were this the case we should not only find most recent membranes to a certain degree cribriform and incapable of retaining fluid, but, as Villermé seems to admit, they would be more or

less opaque. To obviate this objection he appears to have considered the transparent membranes as further advanced than he is warranted in doing.

"There is a form of effusion most completely opposed to that which I have just described; it is more or less opaque, and turbid; of a light-yellow or solid white colour, not so thin as serum, but of a somewhat viscid consistence, more nearly resembling thin purulent matter, and having no tendency to form adhesions between the contiguous serous surfaces. The effusion into the peritoneal cavity in many cases of puerperal fever is of the kind of which I am now speaking. Between this last form of effusion, in which the plastic property appears to be wholly wanting, and that which I first described, there are numerous gradations, dependent, as I believe, on the different proportions, in which the minute particles which give turbidity to the effusion are mixed with the plastic matter. Sometimes there is only a sufficient quantity of the latter to unite the former into light-coloured opaque flocculi, and flakes of various sizes, of feeble cohesion, either very slightly adherent to or wholly detached from the serous membrane, and absolutely incapable of organization. At other times the quantity of the plastic material in the effusion is sufficiently great to allow of its assuming the form of membranous layers, or of an opaque whitish false lining to the cavity. Its organization, though not always prevented, is very much retarded by the opaque particles, which are either uniformly diffused through it, or found in more or less isolated and detached collections of different sizes, and bearing considerable resemblance to tuberculous matter, to which, I apprehend, they are very closely allied."

The non-plastic effusion mentioned above is frequently a source of irritation; hence we have repeated exacerbations of inflammation, and find the material produced by it of various ages, and in different states and stages of progress.

Of the fact that vessels exist in false membranes there can be no doubt. They were first pointed out by Stoll, and injected by Baillie and Dupuytren, and Dr Hodgkin maintains, contrary to Villermé, that they can be injected with firm size injections at a very early period after their formation,—Villermé stating, on the contrary, that they cannot be injected until a considerable time after their formation, and only with quicksilver.

After describing the formation of bridges of adhesion, the formation of blebs, and explaining the origin of detached bodies within serous sacs, Dr Hodgkin refers to the rarer form of a scabrous surface to a serous membrane resulting from inflammation.

"It is from the first more adherent to the serous surface than either the very recent membranous films, or the opaque organizable flocculi. It has a firm and dense structure; does not become very or even visibly vascular; and presents an uneven unattached surface towards the interior of the cavity. Sometimes it is scabrous; not unlike the papillæ on the tongue of an ox; at other times it has a more reticulated or honey-comb appearance."

The termination of inflammation in gangrene is extremely rare in serous membranes, especially in idiopathic inflammations. Lieutaud and Bichat have described a state of matters something similar. Dr Hodgkin has never seen a case, unless from the effects of injury, or propagated from a contiguous organ, as in hernia or gangrene of the lung. A dark appearance of the serous membranes is liable to occur as a cadaveric phenomenon.

Lecture 3d takes up the consideration of each serous membrane separately, and first the arachnoid. "Any one of the serous membranes," says Dr Hodgkin, "may exhibit all the appearances described in my last lecture; but you will find that each of these membranes is in some measure individualized by the frequency or rarity with which it exemplifies certain conditions." The arachnoid is thus peculiar in several respects.

Our author differs from Foville in the arrangement which he has followed in treating of this membrane. He considers, *first*, the arachnoid external to the brain; *second*, the arachnoid of the ventricles; *third*, the arachnoid of the *plexus choroides*; and *fourth*, the arachnoid of the spinal chord.

Dr Hodgkin agrees with other authors regarding the rarity of any product of inflammation on the polished surfaces of this membrane. In illustration of this, however, he relates a case which we shall transcribe.

"I had myself long been fruitlessly seeking for an example not traumatic of this form of arachnitis, when a case of the kind presented itself. A young man, aged 23, had for several months been labouring under lumbar abscess. He never manifested any symptoms of affection of the head, until between four and five hours before the time of death. On inspection, besides other very interesting appearances, which it is needless here to describe; small, but sufficiently evident and unequivocal recent adhesions were found between the arachnoid covering the *dura mater* and that covering the *pia mater*. The far greater part of the effusion was, however, in the usual situation beneath the arachnoid covering the *pia mater*. It was of a light-yellow colour, and of a thin puriform consistence. It must not, however, be concealed, that even in this case the arachnitis appeared to depend on a local cause, which, though at a distance from the head, was, nevertheless, in a part most intimately connected with it. The lumbar abscess had formed a communication with the spinal canal, through the foramina of conjugation through which the nerves pass out. It was indeed suspected, that the puriform fluid in the spinal canal and within the cranium had been derived from the lumbar abscess, and not from the inflammation of the cerebro-spinal membranes. I am, however, more inclined to believe, that, though some of the fluid in the spinal canal may have been derived from the abscess, the principal effect of the communications had been to excite a general arachnitis."—P. 69.

The products of inflammation on the attached surfaces of the arachnoid are as common as that of the polished is rare. Serum is very commonly found effused into the cellular meshes of the subarachnoid tissue. The coagulable effusion is also noticed, and not unfrequently one that is actually puriform. Effusion of serum into the sub-arachnoid tissue is liable to present the appearance of coagulable effusion under the arachnoid, simply from the distension and consequent opacity of the membrane. This state, however, can be readily distinguished by the simple process of puncturing the arachnoid in several places, to allow the escape of the superabundant serum, and if this is the cause of the opacity, it will very soon resume its transparency; but if there is any lymph effusion along with it, the regaining of its transparency, of course, cannot be expected.

“When the product of inflammation beneath the arachnoid, covering the brain, assumes a puriform appearance, it frequently has a greenish hue which, in some instances, is so strongly marked, as to constitute a leek green. When the infusion infiltrated in the *pia mater* is only partial, it is nearly or quite confined to the sulci between the convolutions, and more especially to the course of the large vessels, when it forms an irregular line at each side of them. It may, therefore, be supposed that it is in these situations that the change from the serous to the puriform character commences.”—P. 73.

“As another result and evidence of a long past or chronic arachnitis, may be mentioned the increased thickness and firmness of the arachnoid and *pia mater* conjointly; in which state they may be separated in large portions from the convolutions of the brain. It must, however, be observed, that this easy separation is not always solely ascribable to the cause just alluded to, since it may be promoted by the abundance of serum infiltrating the *pia mater*, or by the state of the surface of the brain itself; as, for example, in those cases in which it is the subject of atrophy.”—P. 75.

In speaking of arachnitis of the ventricles, the remarks of our author are especially just.

“This membrane,” (viz. the arachnoid lining the ventricles) “may be the seat of either acute or chronic inflammation. In both of these states there is often a copious effusion of a purely serous character, constituting either acute or chronic *hydrocephalus internus*, in the same manner that the serous effusion under the arachnoid covering the convolutions constitutes *hydrocephalus externus*. This is the most frequent effect of arachnitis affecting that part which lines the ventricles; and, in conjunction with this effusion, the membrane becomes thickened, semitransparent, pulpy, and sometimes sprinkled with minute spots of blood. When this form of inflammation has passed into the chronic state, the increased firmness, as well as thickness of the membrane, becomes very evident. It is extremely rare to find flakes of recent lymph accompanying the in-

inflammatory effusion, within the ventricles of the brain ; but as we occasionally meet with old adhesions between the opposite surfaces of the ventricles, it is possible that such flakes may be formed to a trifling extent."—P. 78.

In speaking of the affections of the choroidal arachnoid, Dr Hodgkin refers to the fact that, when serous effusion takes place into the substance of the *plexus choroides*, it is generally collected into small cysts, which give to the plexus the appearance of a bunch of currants. Such appearances are familiar to every one, although their occurrence of the size which Dr Hooper has figured them (two inches in diameter) is extremely rare. Equally common, too, are miliary points and opaque spots in this plexus.

Our author, in treating of the inflammation of the arachnoid of the spinal sheath, neglects to mention an appearance which has been considered of some consequence, and has been delineated as characteristic of the affection. We mean an intensely vascular state of all the membranes, and especially of the arachnoid, in tetanus. This appearance, however, we have ourselves been long inclined to question for two reasons. *First*, The position in which bodies are generally placed after death, favours the gravitation of the blood to those parts ; and *second*, The violent spasmodic affection of the muscles during this disease, and more especially towards the close of it, prevents the complete circulation of a large quantity of the blood in the extremities and muscular parts of the body ; consequently an accumulation takes place in those parts which are protected from such pressure, viz. in the vessels in the neighbourhood of the spine, and in the interior of it. This must give rise to an appearance which will resemble that of inflammation in its early stage.

Pericardium.—There is no case on record of congenital deficiency of this membrane, although universal adhesion of it to the surface of the heart has been mistaken and described as such. Some authors, however, and Tioch in particular, regard adhesions of the pericardium as sometimes congenital ; "and the latter author states in support of this view, that in certain reptiles. such a confirmation is natural. We find an example of this form of pericardium in the iguana."—P. 90.

"When inflammation has altered the quality as well as the quantity of the secretion from the surface of the pericardium, we have either the highly coagulable and plastic product, or an effusion of a more puriform character. The former, as I have shown, leads to the most perfect cellular adhesions."—P. 92.

"It is generally, and I believe correctly, supposed, that adhesions between the two surfaces of a reflected membrane are always the result of an inflammatory process. When there is a considerable admixture of unorganizable matter, the production of adhesions is prevented, in which case the surface of the heart is not unfre-

quently covered with long shaggy, soft, and very feebly organized villi. It is this state of the heart which has in all probability led to the idle and absurd stories of the heart having been found covered with hair. The heart of the great Theminian hero, Aristomenes, is said to have been hairy, and a similar account has been given respecting the heart of old Parr, and of some other individual equally remarkable for his longevity. In other cases in which adhesion has been presented, the surface of the false membranes has a reticulated appearance, which Corvisart, Laennec, and Bertin, have aptly compared to the inner surface of the bonnet or second stomach of the calf; and Laennec has also likened the surface of the false membrane, when in this state, to the appearance produced, by quickly separating two slabs of marble which have been applied together with a small quantity of butter, or some similar substance between them. Bertin mentions a case in which the coagulable part of the effusion formed large and thick masses, which were notched like the comb of a cock. Both Laennec and Bertin speak of the adventitious deposit producing an uneven surface, resembling a miliary eruption, or small-pox pustules. They were probably not the products of common inflammation, but rather allied to scrofula or some of the forms of cancer. I am the more disposed to this opinion, from the circumstance, that in one at least of those cases the mesentery and lymphatic glands were similarly affected."—P. 92-93.

We are inclined to agree with Bertin, in opposition to Dr Hodgkin, regarding the above appearance on the surface of the inflamed pericardium. A case which occurred some short time ago presented precisely the appearance which Dr Hodgkin has so well described above. The patient, a healthy young man, died of a well-marked attack of pericarditis, which had resisted the most active treatment. Upon examining his body after death, no morbid appearance whatever could be observed in it, every organ was strikingly healthy, with the exception of the pericardium and heart, and also the anterior and lower part of the left pleural sac, into which a little albuminous and serous effusion had occurred. The heart and internal surface of pericardium was studded with small whitish spots, presenting quite the appearance of a copious miliary eruption, or a numerous and minute small-pox eruption about the mature stage. Six pounds of sero-purulent fluid with flakes of lymph in it were also found. The substance of the heart itself was soft, and the internal membrane of it and of the upper part of the aorta were very red, probably stained with the blood in contact with them. The appearance which we have just described as present in this case agrees so precisely with the account which Dr Hodgkin has given of the process of inflammation on a serous membrane generally, that we cannot see why he should object to the correctness of the description as given by Bertin. The effusion takes place from the points of vascularity

which have been mentioned, as exhibited in the early stage of inflammation in a serous membrane, and from which also the solid exudation occurs.

The fluid part of the effusion in pericarditis is sometimes very great. Corvisart mentions a case where eight pounds were found; and Bertin another, where the distended pericardium formed a bag, seven or eight inches broad, five deep, and ten or eleven in height. In the case which we have shortly detailed above, six pounds of fluid was found in the distended pericardium after death.

We find our author holding peculiar but certainly ingenious views regarding the opaque white spots found on the surface of the heart. "It is very common," he says, "to find one or more opaque white patches on the surface of the heart. Dr Baillie allows that they may be dissected off; and Laennec admits that this is frequently the case. I have met with one or two instances in which this might have been done, but I certainly agree with Corvisart, in thinking that, in by far the greater number of cases, these patches depend on a deposit on the attached surface. They are generally found on the anterior part of the right ventricle, and rather nearer to the apex than the base of the heart. They are, however, by no means confined to this situation. Respecting the cause of these spots, which can scarcely be regarded as a morbid appearance, nothing certain is known. From the circumstance of their being often found immediately under the sternum, and from their being occasionally met with in other parts of the heart to which a firm and resisting body has been unusually opposed, as, for example, when a bony deposit has taken place between the reflected pericardium, or when an uneven and remarkably indurated liver has even through the diaphragm presented an unequal pressure against a particular part of the heart, I have thought it probable that such pressure, aided by the movements of the heart itself, may have led to the production of these spots. These formations may certainly take place at a very early period of life. I have met with one rather loose and thick, but in other respects perfectly resembling those found in the adult in the right ventricle of the heart of a child only ten weeks old. Similar thickening of the close pericardium sometimes marks the course of the coronary arteries and their branches; and this circumstance, amongst others, tends to confirm the idea which I entertain as to its mode of formation."

In treating of the affections of the pleura, into which our author enters fully, we find a very learned disquisition on empyema, but in which Dr Hodgkin embodies much of the symptoms, prognosis, physical diagnosis, the operation of *paracentesis thoracis*, place where it should be performed, "mode of operation by knife

or cautery,"—all which, we, of course, would expect to find treated of in a work on the practice of physic, but certainly appears a little out of place, in a work with the title of that before us.

Dr Hodgkin makes mention of the somewhat curious and rare appearance of blood in the pleural sac in the following passage.

"I have already mentioned that the product of inflammation of the pleura is at times mixed with blood. Blood may be found in the pleura from other causes, and to a much greater extent. It may occur by a species of exudation in *purpura hæmorrhagica*, from a state of the system allied to scorbutus, when it is probably confounded with one form of pulmonary apoplexy. The bursting of aneurisms is, perhaps, the most frequent cause of the effusion of blood into the pleura; and it may likewise occur from wounds in the chest in which the intercostal or mammary artery has been implicated. I have seen a copious effusion of blood behind the *pleura costalis*, which was extensively detached in consequence of rupture of the aorta independently of aneurism. The vessel, which was much diseased, had suffered a kind of splitting, or lamellar separation of its parietes, which had probably allowed the somewhat gradual escape of blood, since the patient survived several hours from the time of seizure, which appeared to be spontaneous, and independent of external injury."—P. 133–134.

We met with rather a curious instance of rapid effusion of blood into the pleural sac, and which we were inclined to infer had taken place by a species of purpurous exudation.

A corpulent, but otherwise healthy female, about 30 years of age, had been labouring under an attack of continued fever, which was not characterized by severity in any of the symptoms, with the exception of an unusually abundant petechial eruption. On the tenth day of the disease, towards evening, some difficulty of breathing was observed, with a very weak state of the pulse, and she sunk during the night. On examination, a large quantity of effused blood (amounting to nearly two pounds) was found in the left pleural sac, and no opening or abnormal communication whatever could be perceived. The serous membrane was deeply stained over a considerable portion of its upper part.

We find much to interest and instruct in the sixth lecture, on the peritoneum, from which, however, we must content ourselves with one or two quotations. In peritonitis the symptoms are often so completely masked, and the pain so slight, or altogether absent, as sometimes to baffle the most experienced. An interesting case in point is related by our author.

"Amongst the patients of a distinguished teacher in one of the clinical schools at Paris, was a female, whose case not only baffled the diagnosis of the pupils appointed to record and watch, but com-

pletely puzzled the professor himself, and induced him to call in to his assistance his distinguished master, Pinel. The diagnosis of peritonitis, which was instantly given by the veteran physician, and which inspection subsequently fully verified, was founded on the peculiar physiognomy of the patient, rather than on any symptoms immediately connected with the abdomen."

"Professor Louis, who has paid much attention to the subject of peritonitis, has observed, that within the range of his observation, all cases of chronic peritonitis are tuberculous. My own inspections would lead me also to the conclusion, that chronic peritonitis is very frequently combined with tubercles; yet this concurrence has not been so uniformly supported by cases observed in this country as it has been by Louis's cases. That form of peritonitis which is accompanied with copious effusion, and which might easily be regarded as ascites, occurs without any appearance of tubercles. The same may be said of other cases in which the concrete product of inflammation has been more considerable. Since the assertions of Louis have a just claim to importance and respect, from the abundance of valuable evidence by which they are supported, I have thought it necessary to notice the occasional exceptions to his rule, with respect to peritonitis, whilst I confirm the frequent occurrence of the combination which he has described."—P. 148–149.

We entirely concur with Dr Hodgkin in the above remarks.

Lecture seventh, eighth, ninth, tenth, and eleventh, on *Parasitic Animals, Adventitious Serous Membranes, Malignant disease, and the Colour of Animal Tissues*, together with notes and cases in the form of appendix, close the first volume. Our space prevents us from doing more than simply make mention of the names of these last chapters.

In volume II. the author begins the consideration of the mucous membranes; and, *first*, the mucous membranes of the larynx, trachea, and bronchi. The anatomical history of these is divided into three heads; *first*, the mucous membrane of the larynx, and perhaps the first part of the trachea; *second*, the trachea and bronchial tubes and their ramifications; and the *third*, the termination of these tubes in the parenchymatous structure of the lungs, "which," says Dr Hodgkin, "in the healthy state, at least, is obviously composed of minute cells, having their internal surfaces necessarily continuous with the mucous membrane lining the bronchial tubes."

In considering the increased state of the secretion in inflammation of the mucous membrane of the bronchial tubes, we find the following important statement.

"An increase in the secretion from this part of the mucous membrane of the air passages, may coexist with an alteration in its properties, rendering it more fluid, or more thick and tenacious than in the healthy state. The former accompanies an affection of the substance of the lungs; to which I shall have to call your attention

on a future occasion, when speaking of œdema of the lung. It must, in fact, be almost impossible to ascertain the precise source of this serous effusion. It is stated by Andral, that a copious watery secretion, constituting a true bronchial flux, has been observed to take place in conjunction with the absorption of the fluid in the hydrothorax.

“ I believe that a very general increase of the secretion of the bronchial mucous membranes, sufficient to produce almost universal mucous rattle, and a corresponding difficulty of breathing, eminently threatening or even causing death, may be occasioned by an irritating cause, the direct application of which may be very partial ; just as a foreign body irritating a small part of the conjunctiva or Schneiderian membrane, is seen quickly to produce a copious flow from the eyes and nose. I have more than once seen a patient labouring under chest affection, in whom the organic lesion seemed evidently to be confined to a small part of one lung, which was regarded as in a state of inflammation of some weeks standing, in whom the expectoration of sanguinolent, and otherwise discoloured sputa, probably proceeding from that part, was quickly followed by the most distressing dyspnœa ; attended with universal mucous rattle, pale and livid countenance, cold and clammy skin, and extreme prostration of strength, threatening immediate dissolution, in whom these alarming symptoms gradually subsided, the mucous rattle becoming less marked, and the derangement of the respective organs again appearing to be confined to the part originally affected, and its immediate vicinity. The alteration of this state of dyspnœa, which, in its character, very much resembles extreme cases of some forms of asthma, may be attended by expectoration unloading the bronchial tubes ; yet the promptness of the relief, and the apparent inadequacy of the amount of sputa, render it highly probable that the mitigation of the symptoms is, in fact, to be ascribed to the absorption of the fluid from the bronchial tubes. The experiments of Meyer, Majendie, and others, have clearly proved that very active and rapid absorption may take place from these cavities.”—P. 64–65. Vol. II.

In the above remarks we entirely concur with the author.

“ It is not easy to ascertain whether air is ever secreted by the bronchial membrane ; yet strict analogy with what takes place in the mucous membranes in other situations would lead us to suppose that this may be the case ; and it seems not improbable that such an occurrence may give rise to dyspnœa, accompanied by little perceptible perversion of the respiratory sound, as heard with the stethoscope.”—P. 66.

The analogy between the above particular secretion of different portions of a continuous membrane is strictly just, and we think the ideas of our author equally so. Many violent and distressing fits of dyspnœa in old affections of the bronchial mucous membrane are really accompanied with little perceptible auscultatory sound, and are very likely to have their origin as above described.

"The general turgescence of the venous system, and the deep lividity accompanying it, are, I think, more frequent and remarkable in conjunction with bronchitis, acute and chronic, than in almost any other affection; not excepting the blue disease dependent on malformation of the heart, which cause I have repeatedly known to be suspected when the lividity was really dependent on bronchitis.

"In connection with the state of the venous system in bronchitis, it may not be amiss for me to introduce one practical observation, the rationale of which, I confess, I do not clearly understand. I allude to the great relief which, in most cases of dyspnoea from bronchitis, may be obtained from the employment of cupping between the shoulders. The alleviation thus obtained seems to be more salutary and also more immediately perceived by the patient himself, than when blood is taken from the arm. This could hardly have been expected *a priori*, since the abstraction of blood from the arm from being more rapid would seem much more calculated promptly to relieve the loaded right side of the heart."—P. 68–69.

Although we have found with our author that cupping between the shoulders is a valuable means for affording speedy relief in those labouring under bronchitis, yet we have always considered that, more especially in the early stages of the diseases, or when the patient is young and robust, a good full blood-letting has afforded as immediate, and certainly more permanent relief. After general bleeding can be carried no further, there is certainly no remedy in which we place more confidence than in cupping, and it often relieves in a wonderful manner the sufferings of that painful disorder.

A very important practical circumstance is also mentioned by Dr Hodgkin, when alluding to the relief afforded by cupping on the back in bronchitis, viz. the use of mercury given so as to produce ptyalism. "The obvious effect of this remedy," says he, "is to increase the fluid secretions, and induce a sort of general colliquative state. The bronchial lining participating in this influence becomes still further loaded with the secretion by which it was previously oppressed; such at least is the explanation which I am induced to adopt of the manifest failure which I have witnessed in cases of bronchitis treated with mercury." The bad effects which this remedy has under similar circumstances to those above described, cannot be too strongly impressed upon the mind of every practitioner. But we actually find the origin of a more fatal disease of the lungs traced to its malign influence. We refer to gangrene of the lungs. Dr Craigie has lately been led to remark that gangrene of the lung may be not unfrequently traced to the abuse of this mineral, a result to which our author has also arrived. Dr Hodgkin's remarks on this affection appear to us extremely just.

"Gangrene is sometimes met with affecting the substance of the

lung as a sequel to pneumonia ; but it seems generally, if not always, to require some peculiarity in the constitution of the individual rather than merely to depend on intense inflammation. Thus it will sometimes take place with great rapidity in an acute form, in conjunction with plebitis, and in fever ; where a variety of circumstances have occurred to produce in a high degree that state which is known by the term typhoid. When it occurs in a more chronic form it is, I believe, invariably in those persons who are labouring under a marked state of cachexia. I have known it exist where syphilis and mercury had concurred with reduced circumstances, want, and exposure to cold. Although in these chronic cases it is mostly a sequel to an attack of pneumonia which has left the lung in a state of hepatization, yet, I believe, it sometimes affects small spots scattered through the substance of the lung, which quickly loose their vitality without the precurrence of the ordinary symptoms of inflammation of the lung. All these cases of gangrene of the lung are invariably marked by one constant symptom, viz. the horrible fetor of the breath, which, though sometimes present without gangrene, and merely dependent on the state of the secreted sputa, should generally lead to a suspicion and inquiry as to the existence of gangrene."

While we agree with the statements expressed in the greater part of the above paragraph, we cannot admit that gangrenous fetor of the breath is ever present without that state of the lungs being found after death. We are aware that a fetid state of the sputa in chronic bronchitis and phthisis sometimes does occur, but not the peculiar gangrenous fetor, which we are as much inclined to look upon as characteristic of this disease (when present) as we look upon the expression of the countenance in it, or in that of fever. While, however, we look upon this fetor of the breath when present, as being characteristic of gangrene of the lungs, we, nevertheless, are perfectly aware that gangrene of the lung is sometimes found without it. A case of the kind is related by Dr Craigie in his valuable monograph on the subject ; but where the peculiar fetid smell was observed at some distance from the patient's bed.

Dr Hodgkin does not fail to remark the frequent occurrence of this disease in the insane, (as especially noticed in the Lunatic Asylum at Ghent) ; a fact which tends to confirm the close relation between the brain and lungs which has been pointed out by Dr Foville.

Lecture 16th is full of the most valuable and interesting matter. The subject of it is tuberculous deposits in the lungs ; and, although the subject is one which has been so often handled, and is so constantly before the public in some shape or another, we confidently assert that the present lecture contains almost every point of information on this overgrown subject in as clear and de-

finite a light as possible. We have perused the lecture with much pleasure, satisfaction, and instruction, and would strongly recommend it to our readers, our limits preventing us from doing more than simply recommend it.

In speaking of the adventitious productions found in the lungs, Dr Hodgkin refers to a point which seems to us of much interest. In workmen who are exposed to the inhalation of fine dust, earthy collections in the bronchial tubes are said to be common. Dr Hodgkin has not found it so, and, from reasoning, would rather suppose that the irritation which the dust gives rise to on the bronchial membrane would give rise to an increased secretion of mucus, which would wash away the particles, and be expectorated with them. Very different is it, however, with the irritating particles of hard whinstone or sandstone, or the minute particles of steel, which are well known, and universally allowed to remain in the lungs when inhaled, and by their presence producing the popularly known diseases, the stone mason's consumption and the grinder's rot. It would appear, also, from a report which Dr Hodgkin has received "of the fate of the Roman cement makers at Sheerness, that when the inhaled particles have a strong tendency to unite with moisture, and rapidly set, earthy concretions may actually be formed in the bronchial tubes."

The same may be said to occur with those individuals who are engaged in the grinding and sifting of newly burned stucco; and, although we are aware that several have died with various diseases in the Infirmary of Edinburgh, no concretions in the bronchial tubes were found after death.

Our space prevents us going further into this interesting volume, although we have before us the subject of the mucous membrane of the alimentary canal, one full of interest, and which, in the hands of Dr Hodgkin, becomes highly instructive.

In perusing the volumes before us, we have been especially struck with the great fund of information which our author has brought to bear on his subject, as well as the great extent of subject, the discussion of which is included under a very plain heading. The work, therefore, includes a great deal more than its simple title would lead us to expect, and, like most unassuming works, it is full of instruction. We therefore feel ourselves in duty bound to recommend it strongly to our readers, not as a work for simple casual perusal, but as a work of reference, which ought to be on the table of every scientific medical practitioner.

ART. III.—*On the Diseases of the Bladder and Prostate Gland.* By WILLIAM COULSON. Third Edition. 8vo. London, 1842. Pp. 274, and 4 Plates.

HAVING in our last Number given a very full notice of the valuable practical work of Sir Benjamin Brodie, it is not intended again to allude to it. As to Mr Coulson's work, it may be mentioned, as marking the public opinion of it, that though it was only in 1838 that the first edition appeared, a second was called for in 1840, and the present, the third edition, came out during the last autumn. Though to a certain extent wanting in that which gives especial value to the work of Sir B. Brodie,—extensive practical experience in the management of the diseases of which he treats,—Mr Coulson gives an accurate view of the present state of our knowledge on the subject, shows a very fair amount of practical experience, and has, in addition, illustrated his work with a very interesting series of cases, chiefly from his own practice.

Mr Coulson's work is divided systematically into 15 chapters; 1. on the Urine; 2. Irritability of the Bladder; 3. Paralysis of the Bladder; 4. Acute inflammation of the Mucous Membrane of the Bladder; 5. Chronic Inflammation of the Mucous Membrane; 6. Acute Inflammation of the Muscular Structure of the Bladder; 7. Chronic Inflammation of the Muscular Coat; 8. Inflammation of the Peritoneal Coat of the Bladder and of the subjacent Cellular Tissue; 9. Spasm of the Bladder; 10. Fungus Hæmatodes and Cancer of the Bladder; 11. Vesical Calculi; 12. Wounds and Injuries of the Bladder; 13. Acute Inflammation of the Prostate Gland; 14. Chronic Inflammation of the Prostate Gland; 15 Prostatic Calculi.

It is unnecessary to notice the author's general remarks on the urine, after the very full notice so recently taken of the same subject, when giving an account of the work of Sir B. Brodie.

Irritability of the bladder is defined to consist in the frequent desire to void urine, which symptom does not depend on the presence of inflammation or other organic affection of the bladder or prostate. It is most important to ascertain in every case the cause of the irritability, as the success of the treatment depends entirely on this. Thus in many cases it depends on the presence of stricture of the urethra, or of derangement of the digestive organs, or as a consequence of taking alkaline remedies for too long a time, or of gouty and rheumatic states of the system. It also sometimes depends on a mere nervous state of the organ, or supervenes on paralysis of the bladder, or from a contracted state of the prepuce, from disease of the kidneys, presence of calculi, from a morbid state of the urine, &c. The cause being known, the treatment

must be directed to its removal. If the patient be gouty and rheumatic, with scanty, acid, or gravelly urine, alkalies are proper remedies, with colchicum and hyoscyamus, infusions of cascarilla or colombo, and occasional doses of blue pill or of salines. Sometimes cupping the perineum and the warm-bath afford great relief. If the irritability depend on disease of the kidney, setons and issues in the lumbar regions may be added to the other remedies. In those with a nervous temperament, if the urine be alkaline, dilute mineral acids with decoction of *Pareira brava* are useful. In other cases, where the urine is neutral, the extract of *uva ursi*, with that of hop or of hyoscyamus, together with opiate suppositories or injections, may be administered. Decoction of the *uva ursi*, but especially the infusion of bucku, frequently afford relief when other remedies fail. Injection of the bladder has not succeeded in the author's hands in affording relief in this disease. The preparations of iron are recommended when the irritability occurs at the period when the menstrual secretion first appears; and valerian with the *vinum aloes* in hysterical subjects.

Paralysis of the bladder may be the effect of many different states. Injury or disease of the brain or spinal chord, typhus, or other severe fevers, old age, pregnancy, neglecting too long to expel the urine, and many other states, give rise to the disease. The incontinence of urine observed in children, the author refers to this head. It seems to be very questionable, however, whether in their case the incontinence arises from this cause, seeing that these children for the most part retain the perfect command of the bladder during the day or whilst awake, and when it is passed involuntarily during sleep it is not, as occurs in true paralysis, by a dribbling of urine from the over-distended bladder, but the bladder after being filled is at once freely and effectually contracted, so as to expel every drop of its contents. The incontinence of urine in children would, therefore, appear rather to depend on a certain morbid state of irritability about the neck of the bladder, combined, perhaps, with a diminished degree of general nervous energy, so that during sleep the child is not wakened by the sensation of the usual desire to micturate.

When paralysis of the bladder exists, however it may have originated, that organ becomes unusually distended, and when the distension arrives at a certain extent, the urine in general begins to dribble away. When in this state, strong straining efforts will sometimes cause a few ounces of urine to be passed, which is apt to lead to the belief that the bladder has been emptied, and that the patient is labouring under irritability of the bladder, not paralysis. The introduction of the catheter is the surest means of diagnosis, often drawing off four or five pints of urine when it was thought to be empty.

The curative means consist in drawing off the urine three or four times in the twenty-four hours, at intervals sufficiently short to prevent over-distension, until the bladder recovers its contractile power. Mr Coulson very justly remarks that twice a-day is much too seldom for this operation being performed, and that, as a person in health usually empties the bladder at least four or five times in the twenty-four hours, "it is especially incumbent on us to relieve the bladder at least as often as nature herself does." If the bladder cannot be relieved by means of the catheter it must be punctured. Constitutional treatment requires to be followed out, depending on the cause of the malady. Strychnine has been given with success in some cases.

Mr Coulson describes by the name of acute inflammation of the mucous coat of the bladder, what would, with greater propriety, be termed ulceration of the mucous coat, for it is by no means proved that this state results from *acute* inflammatory attacks, seeming rather to be dependent on a specific form of inflammatory action. This opinion appears to be strengthened from the kind of subjects in whom this disease most commonly occurs, from the peculiar appearance of the ulcerations themselves, and the fact mentioned by Mr Coulson himself, that the "loss of much blood cannot be borne." The disease is characterized by excessive and increasing pain in the region of the bladder, along the urethra, down the perinæum and thighs, with frequent urgent desire to make water. If the disease be not arrested in its first stage, ulceration of the mucous membrane occurs, and proceeds till it destroys the whole of that membrane. The ulceration frequently perforates the bladder, causing extravasation into the abdomen, or cellular tissue, or communicating with the intestines. Strong feverish symptoms usually attend this complaint. The disease is most frequent in the female sex. The urine is red or lemon-coloured, with shreds of lymph and mucus, and afterwards of purulent matter floating in it. The diseased action often extends to the ureters and kidney.

The morbid appearances consist in vascular injection intermingled with little spots of extravasated blood. The inflamed surface is either limited to certain portions of the bladder, and then chiefly to that part which adjoins the neck, or extends over the whole surface. Coagulable lymph is occasionally found covering the membrane. In some severe cases the muscular coat also is attacked, presenting here and there gangrenous spots. When the disease has lasted some time, it is generally found that the whole of the mucous membrane has been removed by the ulcerative process, leaving the muscular coat beautifully exposed. Sometimes, however, the ulcers present themselves, of about the size of a sixpence, with elevated edges, and a red surface. When small they

resemble syphilitic sores, from having an excavated surface, and raised margins. The ureter and kidney are often found in a similar diseased state.

As to the treatment, it is recommended to draw blood locally by leeching and cupping the hypogastric region; general blood-letting is not mentioned, as it is remarked, that in this disease the loss of much blood cannot be borne. Opium or its preparations ought to be given in doses sufficient to allay the severity of the pain, and they constitute the most valuable remedy. Anodyne injections or suppositories are of considerable utility, and even injections of oil and opium into the bladder have been recommended, but are not approved of by the author, as the introduction of a catheter so greatly aggravates the severe pain. Counter-irritation over the pubes, and the hip-bath at night, infusion of bucku, copaiba, or oil of cubebs, infusion of hops and alkalies, all are occasionally useful, but mercury seems to be of no use except at the very commencement. The prognosis is always unfavourable: if ulcerations have once commenced, life may be prolonged, but the disease never removed.

A few interesting cases of the disease are narrated, together with the morbid appearances observed on dissection. Dr Prout, in referring to these cases, considers them as allied to irritable bladder, dependent on organic affection of the kidney. Mr Coulson, however, states that there is one diagnostic mark by which the disease he describes may always be recognized, viz. the intensity of the pain which always attends inflammation and ulceration of the mucous membrane of the bladder, and soon exhausts the strength of the patient. In irritable bladder, dependent on organic affection of the kidney, there is sometimes, but not always, pain in passing the water,—“the frequency of making water is the most distressing symptom.”

We may pass over what Mr Coulson states relative to the symptoms, morbid appearances, and general treatment of chronic inflammation of the mucous membrane of the bladder, as this subject was so fully treated when noticing the work of Sir B. Brodie. On two modes of local treatment not generally known in this country it is necessary to enlarge; these are, cauterization of the internal surface of the bladder by means of solid nitrate of silver, as practised by Professor Lallemand, and injection of the balsam of copaiba, as used by M. Devergie. To effect the cauterization, the bladder is first emptied completely, and a catheter open at both ends, and fitted with a stilet, which has a small excavation near its extremity in which the nitrate is placed and there fused, is introduced into the empty bladder. The stilet is then protruded, and rapidly turned from side to side, to touch as many points of the surface as possible. It is then withdrawn within the catheter, and

the whole removed. Sharp pain at the neck of the bladder, and in the rectum, with irresistible desire to pass water, is experienced, and the few drops which are expelled cause a scalding sensation, and are often accompanied by a few drops of blood. These feelings decrease gradually, so that by the second or third day there is no more pain, and a few gray eschars are passed along with the urine. If too much caustic be used, complete retention of urine follows, but the catheter must not be employed for its relief, but hip-baths, emollient drinks, narcotics, &c. In the majority of cases, one application effects a cure; some require a second or even a third; but Professor Lallemand never saw a fourth required.

The injections of copaiba are not to be resorted to until the inflammation and local pain are calmed by general means, by previous injections of mucilaginous fluids, and then of narcotics. One drachm of copaiba to the ounce of barley-water is then injected, either by itself, or in union with narcotics, and continued not oftener than once a day, nor more seldom than every other day, till the cure is effected.

It seems to be very doubtful whether there be really such a disease as pure acute inflammation of the muscular coat of the bladder. We are inclined with Dr Prout to believe, that, if it ever occurs, it is in gouty subjects, and is the result of gouty inflammation; but that it is very much to be doubted whether, even in their case, the inflammation is entirely limited to that structure. In this opinion Mr Coulson participates, and the disease which he describes under this head may consequently be termed general inflammation of the coats of the bladder. It is very objectionable, therefore, to describe this form as acute inflammation of the muscular coat, more especially when we find that the inflammation terminates in abscess, which muscular inflammation never does, and its exciting causes are said to be exposure to cold, suppressed gonorrhœal discharge, administration of cantharides, injuries, &c. When rigors, strong feverish symptoms, pain in the intestines, rectum, and bladder, painful erections, desire to pass urine, without the power to do it, occur, this form of affection may be suspected, but it requires simply the same treatment as acute inflammation in other internal organs, copious depletion, the free exhibition of calomel and opium, &c.

Mr Coulson describes as chronic inflammation of the muscular coat of the bladder, what might, with greater propriety, be termed hypertrophy of the muscular coat, for it seems to be very doubtful whether the great additional thickness of that coat be really owing to chronic inflammatory action. This appears the more apparent if we attend to the symptoms of the disease, and more especially to the causes of this morbid appearance. It is found to be present as a morbid appearance in almost every case where,

from any cause, whether from an enlarged prostate, or from the presence of a stricture, the urine has been prevented from being freely excreted. In consequence of the continuance of the obstacle to the flow of urine, the bladder requires to make a greater effort to expel its contents; its muscular fibres consequently enlarge or become hypertrophied, in the very same way as the muscles of the heart enlarge when the valves are diseased. The process of enlargement cannot therefore be termed one of inflammation, for, however long the affection may continue, or however great the enlargement of the muscular fibres, their structure as muscular fibres continues unaltered. There is in general no morbid deposit; no appearance present which could lead to the belief that inflammatory action had been going on, but only those which would show that the action of the parts had been increased. In fact, not only do these appearances meet with an analogy in the muscles of the heart, but still more so in the muscular fibres of the uterus during pregnancy, and yet no one in this last case would venture to term the increased action of the uterus by the term of chronic inflammation. In addition to all this, it may be mentioned, that every organ, but especially the muscular, when in a state of even chronic inflammation, is the seat of more or less acute pain, resembling the rheumatic, on the smallest movement; but in this complaint the diagnostic mark of the disease by which it is to be distinguished from irritability of the bladder is the absence of pain. It is not, however, meant to be asserted, that an attack of inflammation may not give rise to that action which shall lead to the production of hypertrophy of the muscular coat, but merely that in general other causes are in operation which are quite capable of producing the peculiar morbid appearance without the supposition of any inflammatory action.

Mr Coulson, however, describes as an independent disease the symptoms which attend those affections where on dissection the muscular coat is found hypertrophied. Thus he mentions as symptoms of this affection, uneasiness about the region of the bladder, frequent desire to make water, especially during night, but considerable straining before the water makes its appearance, and then it does not flow readily, pains in the limbs and back, &c. When the disease is caused by stricture, or other local disease, this must be removed before the disease can be alleviated, after which colchicum, carbonates of the alkalies, and decoction of *Pareira brava*, or infusion of wild carrot seeds, have been found highly useful. Bucku, *Uva ursi*, hyoscyamus, hop, nitric ether, &c. are also sometimes of benefit. In all cases it is requisite occasionally to make use of the catheter, as the bladder never completely empties itself by its own efforts.

Nothing new is stated on the inflammation of the peritoneal

coat of the bladder, almost the whole matter being simply quoted from the work of Sir B. Brodie.

Spasm of the bladder is most usually a sympathetic affection, caused by the irritation of stone in the bladder, or during gonorrhœa; it has also been observed in hysteria. The disease comes on in fits, and for the most part suddenly,—characters which serve to distinguish it from inflammation. If the spasm chiefly affect the neck of the bladder it occasions retention of urine, if the fundus, the urine is violently and suddenly expelled. When produced by stone it is apt to terminate in inflammation. The treatment varies according to the cause of the malady; opiates, leeching the perineum, the hip-bath, and hot fomentations being had recourse to as adjuvant means.

Fungous excrescences occasionally form on the internal surface of the bladder, causing symptoms which often simulate those of stone. Any long-continued irritation may give rise to them, and none more frequently than the presence of a stone. When the tumour is of the nature of *fungus hæmatodes* there is always a disposition to hemorrhage from the bladder; indeed, this is often the first sign of the disease. When cancer occurs it has in general spread from the surrounding organs, the rectum or uterus, and indicates its presence by the same symptoms as elsewhere. Palliative treatment is all that can be done; in either case the disease cannot be cured.

Mr Coulson gives a long and interesting account of the symptoms of stone in the bladder, of the varieties of urinary calculi, and of the operations of lithotomy and lithotritry. The account of the operation of lithotomy is rendered interesting, from embodying the results of the valuable tables and remarks of Mr Crosse, showing the average ratio of mortality from the operation at different ages, and also from the varying size of the stone. To the account of these two operations for the removal of stone, some remarks are added on the solution of the stone within the bladder, either by injecting fluids into that viscus, or by administering agents by the mouth. It seems to be unnecessary to enter on what is stated by Mr Coulson on this subject, seeing that almost all his facts are taken from Dr Willis's work on the treatment of stone; but they merit a careful perusal.

Relative to the occurrence of foreign bodies in the bladder, the author does little more than state that such things have been met with, and that particular means have been devised by various surgeons for their removal.

Wounds and injuries of the bladder are always attended with considerable danger. When it ruptures, in consequence of the effect of blows or other injuries, it generally gives way at that portion which is covered by peritoneum, when rapid death takes place

in consequence of effusion of urine into the peritoneal cavity. The bladder occasionally bursts during labour, it may also burst from an ulcer eating through the coats. All these cases are in general speedily fatal. In consequence of great pressure from the head of the child, a portion of the vagina and bladder occasionally sloughs off in the female, and gives rise to most distressing symptoms. Many operations have been suggested for the cure of this malady, all of which have occasionally succeeded in the hands of careful surgeons. Mr Coulson shortly enumerates the chief of these, but scarcely with sufficient minuteness to render them available in practice to those not previously acquainted with the mode of performing them. They consist of paring the edges of the false aperture, and retaining them in contact by means of ligatures, applying the actual cautery repeatedly to the edges of the sore, or the nitrate of silver, or other caustic, trusting to the consecutive contraction for the closing of the aperture.

The three remaining chapters of Mr Coulson's work are devoted to the diseases of the prostate gland. Acute inflammation of the prostate is described as a distinct affection, characterized by heat and pain in the perineum, extending towards the anus, frequent micturition, and a scalding sensation in making water. The rectum feels hot to the touch, and sometimes the prostate is felt as a smooth, round, and hard body, pressure on which causes great pain. This state is caused by pressure of vesical calculi on the neck of the bladder, by strictures, by gonorrhœal inflammation extending backwards, or by the gum resin or stimulant injections used for their cure, by exposure to cold and wet, by the irritation of worms in the bowels, &c. If not checked, the inflammation rapidly extends to the bladder, producing retention of urine, high febrile symptoms, often followed by rigors, which generally mark the occurrence of suppuration. The abscess may open into the urethra, rectum, or bladder, or into the cellular substance between the bladder and rectum. During the inflammatory stage, active depletion is required, and this may be effected by drawing blood from the arm, and also by applying leeches to the pubes or perinæum, or more directly to the diseased gland, by means of leeches applied to the surface of the rectum over the gland, with the aid of a speculum. After depletion, morphia in large doses, and the careful employment of the catheter to relieve the retention of urine, with Dover's powder, opiate glysters, and the hip-bath, are the chief remedies required. If an abscess has formed, it is desirable to prevent its bursting into the bladder, rectum, or urethra; and Mr Coulson advises to puncture the abscess from the perinæum so soon as fluctuation can be detected. When it has burst into the bladder or urethra, it is recommended to leave a flexible catheter in the urethra rather than irritate by its often introduction.

Under the title of chronic inflammation of the prostate gland, Mr Coulson not only includes that subdued inflammatory state in which the prostate remains after some acute states, but also what is described by almost every other writer as chronic enlargement of the prostate. Though in many cases this enlargement may and does depend on chronic inflammatory states, yet it appears to be of such a constant occurrence in persons advanced in life, who have never had any affection of the urinary organs, nor experienced any uneasiness in the prostatic region, that it does seem somewhat premature to class this form at least along with that caused by decidedly inflammatory attacks. It is an undoubted fact, that, in individuals in whom the prostate is naturally enlarged, sub-acute or chronic inflammatory symptoms are much more easily excited than in others; but this does not prove that the natural enlargement, dependent on the effects of age, is owing to an inflammatory state. Mr Coulson seems to have paid little attention to this natural enlargement of the prostate, almost all his observations being directed to what comes strictly under what he terms chronic inflammation of the gland.

The prolongation of the inflammatory action in its chronic state gives rise to enlargement of the organ. This may be effected in two ways, *1st*, by purulent matter having been formed in the parenchyma of the organ, but not discharged, when the watery portions are absorbed, and the more solid remain in the form of tubercular depositions; and, *2dly*, by the deposition of serosity in the cellular tissue, when, the more liquid parts being removed, the albuminous portions become organized. The different lobes of the prostate do not equally enlarge. The left lobe is more frequently enlarged than the right, causing the urethral canal to bend to the right; and the third or middle lobe is very frequently chiefly affected, projecting as a nipple into the cavity of the bladder, and acting as a valve to close the aperture of the urethra.

As the gland increases in volume, the parts project into the bladder, and prevent it from expelling the whole of its contents. A constant desire to pass water is, therefore, experienced day and night, and gradually wears out the patient, from the constant irritation, pain, and watchfulness.

This effect of the enlargement is to produce inflammation of the internal or mucous membrane of the bladder in contact with the tumour, which gradually spreads over the whole organ. This is the principal cause of the great and frequent desire to micturate.

The treatment required in these cases is to pass the catheter every six or eight hours, or leave it in the bladder, taking it out and cleaning it every third day or so. Very good directions are given for the passing of the catheter both when spasm prevents its introduction, and also when the lobes of the prostate project so as

to obstruct the opening. In cases where all attempts fail to introduce a catheter, and relieve the distended bladder, that viscus must be punctured. Of the two modes of operation, Mr Coulson prefers that from the rectum, as being the one easily performed and less liable to infiltration of urine than that above the pubes. Iodide of potassium has been applied to the enlarged prostate on the tip of a bougie, over which was a coating of tallow. The bougie was introduced as far as the gland, and when the tallow melted the iodide came in contact with the gland. When hemorrhage from the prostate occurs, acetate of lead and opium, or galls and opium, alum or sulphuric acid, are required. Suppositories of hemlock and opium, opiate glysters, and the hip-bath are useful remedies to allay irritation. When the enlargement depends on scrofulous degeneration, sarsaparilla, *cicuta*, *liquor potassæ*, electricity, and sea-bathing have been recommended.

The symptoms attending calculi of the prostate gland are usually very obscure; it is only when large or numerous, or projecting into the urethra, that they give rise to symptoms of stone in the bladder. They generally consist of phosphate of lime, and vary in size from a pin's head to that of a pea. A retention of urine, or pain about the neck of the bladder, with frequent desire to make water, are often the only symptoms indicating the presence of prostatic calculi; examination by the rectum sometimes allows it to be ascertained that the prostate is enlarged, but the cause of the enlargement cannot in general be ascertained. If any of the calculi project into the urethra, the sound striking on them conveys the impression of a stone in the neck of the bladder or urethra, but it can rarely be ascertained whether this is a stone from the bladder or from the prostate. When their presence is recognized, they ought to be attempted to be removed by Weiss's forceps. When, however, they are so impacted as to elude the grasp of the forceps, and the symptoms are so distressing as to require surgical aid, the patient must undergo an operation somewhat similar to that of stone.

Mr Coulson's work is illustrated by four good lithographs of diseased bladder and prostate glands. The first represents the bladder with complete destruction of the mucous membrane; the second, hypertrophy of the muscular coat; the third, enlargement of the middle lobe of the prostate; and the fourth, enlargement of the lateral lobes of the prostate gland.

ART. IV.—*A Treatise on the Nature, Causes, and Treatment of Erysipelas*. By THOMAS NUNNELEY, Lecturer on Anatomy, Physiology, and Pathology, in the Leeds School of Medicine. London, 1841. 8vo. Pp. 307.

Two modes may be adopted of considering the nature of ery-

sipelas. One is to regard it as a mode of inflammation peculiar to the skin, confined to that texture, not appearing in any other; and evincing its presence by peculiar effects. This was the mode adopted by Cullen, Pinel, Bichat, Willan, Bateman, Hildenbrand, father and son, Mr Lawrence, and several other pathologists who have adopted these views. Another mode is to consider erysipelas as a peculiar form and kind of inflammatory action not confined to the skin, but affecting various, in some cases, any one of the textures of the animal body, and producing in all of them peculiar effects, similar to themselves, however, in all cases. Of the latter mode of viewing the disorder, some glimpses may be met with in the Essay of John Hunter on Inflammation, and in the writings of John Peter Frank, and his son, Joseph Frank. The latter author first makes on its seat the following remarks,—“Rose spares no region of the skin. Thus it attacks, if not the whole surface of the body, at least, in one case, the face and scalp; another the trunk and genital parts; in a third the extremities, not to speak of the surface of the viscera itself.” And afterwards, he adds on this internal rose, the following statement,—“It has been said that the ancients not improperly established the doctrine of internal rose. The existence of this, or at least an internal superficial inflammation, is confirmed by morbid inspections. It often happens that persons liable to habitual rose, either of the head or of the lower extremities, at the period when they ought to labour under this disease, fall into inflammations of the internal organs, the resolution of which is scarcely to be obtained without the appearance of rose in some external part.”* This excellent practical physician might have added, that in no case of rose is the state of the external part the most serious and important; and in all instances previous to, or along with, the redness, and swelling of the skin, there are various symptoms of irritation, congestion, and disordered circulation in one or more of the internal organs. The question to be considered, is this morbid state of these internal organs erysipelas?

The present work is perhaps the first attempt to treat the latter view of the disease on a comprehensive and systematic scale, and to inquire what are the just grounds afforded by observation and experience for taking this view. If the author shall be in many respects unsuccessful in establishing the main object of his researches, still it cannot be denied that the learning and judgment with which he has investigated the subject, as well as the ingenuity with which he has illustrated his various arguments, entitle his work to great attention, and recommend it most strongly to the notice of all those readers who take interest in the progress of pathological science.

In an introduction, which occupies about nine pages, Mr Nunneley enumerates shortly the classifications and arrangements given

* Josephi Franki, Præceps Medicinæ Universæ Præcepta, Partis I., Vol. ii. p. 146.

of rose by various medical nosologists and surgeons; and the chief inference that results from this comparison is that the ideas of different authors have been very discordant and inconsistent. This discordance has resulted, in many instances, from confounding erysipelas with erythema, with carbuncle, with shingles, with eczema, and with diffuse inflammation of the cellular tissue, and different forms of gangrene.

The author then enters into a more minute view of the nature and distinguishing characters of erysipelas, as taught by the principal modern authorities, for instance, Mr John Hunter, Mr Travers, Dr Duncan, Mr C. Hutcheson, Mr Lawrence, Mr James, all of whom either positively say, or at least imply, that rose attacks not only the skin but the cellular membrane, and the adipose membrane. He does not allow that the presence of vesications is necessary to erysipelas; and hence he refers erythema to the same head; and he thinks that none of the facts that we know, regarding the phenomena and effects of this disease, show that it ought to be regarded as a peculiar form of inflammation distinguished by the property of spreading or diffusing itself, and thereby disuniting and destroying parts, in contradistinction to phlegmonous inflammation, which, he argues, evinces the opposite character. In the latter, the tendency is to effuse lymph and agglutinate contiguous tissues and organs. In the former, the tendency, he infers, is to effuse serous or purulent matter, and thereby to disjoin and separate contiguous tissues and organs. (P. 21.)

Proceeding upon these views, Mr Nunneley argues that, if we act consistently, we ought to separate erysipelas from the exanthemata entirely, and also deprive it of specific character; and he adds, "it will become necessary to include under the term (erysipelas) many diseases which by most are regarded as having no connection with it, though some few authors have advanced opinions and statements in favour of the views I have taken." P. 22. In accordance with the conclusions now stated, the author infers that several forms of disease, differing from each other much, not only in severity, but in the textures attacked, ought to be referred to the common head of rose; and while he takes care to impress on the reader that between the opposite extremes of great mildness or calm, and great violence, many intermediate shades may be found, he adds that all are attended with asthenic constitutional symptoms, and consequently form the most dangerous disorders to which mankind is liable. He then presents his enumeration of erysipelatous diseases in the following order:

I. *Erythema*, with its various species, according to the classification of Willan, Bateman, and Rayer; except the *erythema intertrigo* or erosion of the skin, which, as a local affection produced by local irritants, wholly unconnected with constitutional symp-

toms, and not requiring constitutional remedies, has no relation, he conceives, to the other species of erythema. *Erythema nodosum*, as dependent on inflammation of the periosteum, and only secondarily affecting the skin, he in like manner is disposed to exclude.

II. *Erysipelas* ; in the forms usually described under the term, whether of the head and face, trunk or extremities, idiopathic or sympathetic.

III. *Diffuse inflammation of the cellular membrane*, as the term is used by Dr Duncan, Junior, who first distinctly called attention to this form of complaint.

IV. *Puerperal Fever*.

V. *Diffuse inflammation of the Serous Membranes* ; which is perhaps most frequently seen in the peritonæum, especially after wounds of it in its neighbourhood, as after the operation for showing strangulated hernia or stone.

VI. *Diffuse inflammation of the Mucous Membranes* ; a form most frequently seen about the fauces, as some forms of *angina pharyngea* or *laryngea*.

VII. Possibly to this belong some forms of *Arachnitis*.

VIII. *Diffuse Phlebitis*, and diffuse inflammation of lymphatic vessels.

I. Under the *first* head, in which the author studies to show that erythema is merely a variety of erysipelatous inflammation, we find the usual facts and arguments adduced, by which it is conceived that this alliance is established. The small degree of swelling, and the absence of vesication in erythema, are, he alleges, insufficient to establish any difference in kind. There is often, he adds, little swelling in some of the most dangerous forms of erysipelas, as the erratic, and rarely vesications. In rose of the head and face also, vesications are not constant, and there is observed every variety of the disorder, from a mere blush of redness to the most severe form in which the disease appears,—vesications, ulceration of the true skin, and mortification.

Secondly, he maintains that the exciting causes are very much the same in both ; and he adds, also, that even treatment has a very powerful effect in influencing the external characters of the disease, active cathartics very often producing a most favourable change upon the surface and edges of a sore attacked with erysipelatous inflammation.

In the *third* place, the distinction between the febrile symptoms preceding the local inflammation in rose, and accompanying or following in erythema, he regards as equally inadmissible, because often resting on fallacious grounds. In short, Mr Nunneley maintains, that hitherto no constant and unquestionable diagnostic symptoms between erythema and rose have been adduced.

II. Mr Nunneley proceeds next to consider the question as to the disease named diffuse inflammation of the cellular membrane, and he adduces in favour of this view an array of argument, as might be expected, much more lengthened and elaborate. These arguments he arranges under the following heads.

" 1. The constitutional symptoms are of the same character ; the commencement of the ailment in both forms is marked by the same general disturbance. It is true that when the cellular membrane is the part affected, the general symptoms are often more severe and sudden in their appearance, particularly when resulting from a poisoned wound ; when, however, the affection arises spontaneously this is not the case, and when it is so it is a difference in degree and not in kind. It is probably occasioned by the virulent power of the exciting cause, in the case of a poisoned wound suddenly inducing a diseased condition in a body previously in a state of comparative health ; while, when the disease arises spontaneously, there has been a more gradual progression towards the condition where the disorder is openly declared.

" 2. The changes which are locally produced by erysipelas and diffuse cellular inflammation, are very similar to each other, allowance being made for the disorder being more superficial in the one case than in the other. Indeed so nearly alike are the effects of the disease in the part attacked, that it would, I think, be difficult to say for which form the descriptions are intended, were there not some preconceived notions on the subject."—Pp. 48–49.

" 3. The results are the same, if re-collection does not occur ; viz. suppuration and sloughing of the parts ; and in case the patient recovers, the permanent effects of both complaints are the same."

" 4. Diffuse cellular inflammation is met with in puerperal fever." " If the law that no two diseases can occupy the same place at the same time be in any measure correct, and there is no reason to doubt its general applicability, it would go far towards showing the identity of these conditions, and that puerperal fever and diffuse inflammation of the veins are closely allied to erysipelas, I shall presently take occasion to show.

" 5. The predisposing causes are the same, and the disorders are developed in precisely the same sort of constitutions ; as in those who perpetually live at the highest point of excitement, and whose chylopoietic organs are constantly bordering upon, if not actually in, a diseased condition, and in those whose constitutions are broken down or debilitated from any cause, as anxiety, either mental or bodily, close confinement, too free living, &c."

" 6. The existence of diffuse inflammation of the cellular membrane and erysipelas, is favoured by the same condition of the atmosphere, and both forms of complaint prevail epidemically at the same time. Thus, at the time the cases related by Dr Duncan occurred in Edinburgh, there was noticed a remarkable disposition to erysipelas, both in the hospital and city. The cases of diffuse cellular inflammation which were so fatal at Plymouth Dock, (irritative

fevers as they are called by Dr Butter,) occurred when erysipelas was prevalent in the dock-yard, and also in the town of Devonport in 1824. Carbuncle and malignant pustule are often epidemic together in various parts of the continent; and puerperal fever was raging with dreadful fatality in Dublin, when Dr Colles' cases of diffuse cellular inflammation occurred.

"7. Both forms of the disease (independently of inoculation) occur principally in the same situations, and under the same circumstances as in large towns, and in crowded, ill-ventilated, or impure hospitals,—especially lying-in hospitals.

"8. In both forms, there is the same tendency for parts at a distance from the original seat of the inflammatory action to become involved, and also to the deposition of pus in parts, where during life no symptom could have led us to suspect the presence.

"9. The treatment, both general and local, is the same.

"10. One form of the disorder is exceedingly liable to produce the other in a second person. Thus by far the most frequent cause of diffuse cellular inflammation is wounds viewed in the examination of those recently dead from inflammation following injuries to veins, or from erysipeloid inflammation of the mucous or serous membranes, or, at least, where the effused matters are characterized by an absence of adhesive lymph, and the symptoms during life have been of a typhoid or dynamic type. This fact is so remarkable, that I must beg to be allowed to refer as briefly as possible to some of the recorded cases. Another fact, also of great importance, is, that, in several instances, two or more persons have been affected in the same manner, from wounds received while examining the same body. Among the diseases which are likely to excite this scourge of anatomists, none possess a more unfortunate pre-eminence than puerperal fever, or that diffuse inflammation which sometimes follows injuries to the peritoneum."—Pp. 48, 49.

The author then adduces various cases illustrating the fact now mentioned, that the application to wounded surfaces of the fluid contained within the serous membranes when diseased, and especially within the peritoneum, are often followed by the most violent and speedily fatal symptoms. It is, indeed, impossible to doubt the justice of this conclusion; for it has long been matter of observation by many experienced persons. It is also most important to observe, in reference to this matter, that the more recent the body is, the danger appears to be the greater, not only of inoculation by the fluid, but of the pernicious effects being produced. It is, nevertheless, not clear to us that this proves the connection of either of these diseases with erysipelatos inflammation. We see the effects of a morbid animal poison; but these effects do not prove that either diseases are of the nature of erysipelas. Many animal poisons produce erysipelatos or erysipelatos inflammations. Thus not only the fluids of the dead human body are followed by erysipelatos inflammation, but various other poi-

sons, as the malignant pustule, the matter of glanders, the sting of the wasp, the sting of the scorpion, and several serpents, produce the same effects. It is, nevertheless, right and candid to allow Mr Nunneley's arguments full force, and to show the reader the kind of reasoning by which he endeavours to establish the truth of his conclusions. With this view he directs particular attention to the influence of the weather and local circumstances; to the presence of diffuse inflammation, as he thinks, in all the fatal cases, in the membranes, skin, veins, or cellular tissue; and thereby to the simultaneous occurrence of the disease in several persons inoculated with the same matter.

"It will be remarked," the author observes, "1st, That Dr Duncan's cases occurred within two or three years, during which erysipelas in its various forms was remarkably prevalent in the neighbourhood. Those of Dr Colles nearly at the same time, when puerperal fever was exceedingly fatal in Dublin. That of Dr Bell, when erysipelas was epidemic in the dock-yard and town of Devonport. And in the cases related by Mr Travers, and others in London, where the dates are mentioned, they are very near together; and where not given, from the context there is every reason to infer it was about the same time. Since this period, the complaint has been comparatively rare, as have the congenerous disorders in the same situations. 2dly, In nearly every case where the cause of death in the body examined is stated, we find evidence of the existence of diffuse inflammation of the membranes, skin, veins, or cellular tissue; and this occurs so frequently, that it must, I think, be admitted, to say the least, there is a much greater tendency in matter effused under this action, to induce a corresponding form of disease, than there is in matter formed under a more phlegmonous action. 3dly, The fact of two or more persons being so often inoculated by the same matter, is also of importance, taken in connection with the extent to which they each were affected. It is to be observed, that in many of these cases one died, and the other after more or less mischief recovered; in the latter the disease was more limited, attended with a more circumscribed action, and altogether more like phlegmon; on the contrary, in the fatal cases, the disease sometimes affected almost half the body,—a proof, were all others wanting, that the severity of the disease very much depends upon the state of the system, and the diathesis of the person receiving the virus; since in these cases, the exciting cause must, of course, have been the same, and yet the effects varied from a thecal abscess (as in Mrs Edie) to the most extensive destruction of the muscles, cellular membrane, and skin.

"How far the disease, in all these cases, originated in inoculation, it would, perhaps, be difficult to say; that it did so in many there can be no reasonable doubt, but it appears probable, that in some there was no actual absorption of any virus, and that the mischief was rather the result of the accidental irritation acting upon a

system already disordered, and, so to speak, ready to take in this excessive irritative action.

“ 11. The two forms of disease are reciprocally capable of exciting each other. Thus diffuse cellular inflammation, excited in the first instance by inoculation with erysipeloid matter, has the power of exciting true phlegmonous erysipelas in another person ; and, on the other hand, erysipelas has the power of exciting diffuse cellular inflammation.”—Pp. 62–64.

In proof of this, Mr Nunneley adduces the case of Mr Newby, as recorded by Dr Nelson, in which diffuse cellular inflammation appears to have followed the application of the fluid contained in the peritoneum of a child who had died from enteritis, while, at the same time, there was erysipelas of the abdomen ;—and three cases, recorded by Mr Gibson, in the third volume of the *Edinburgh Medico-Chirurgical Transactions*, in two of which erysipelas of the face was associated with suppuration of the cellular membrane.

All these facts and arguments, Mr Nunneley contends, amount, if not to demonstrative, at least, to probable or presumptive proof ; and this, he thinks, is all that we are entitled, on such a question, to expect.

To us it appears that the facts, as the author has arranged them, do afford considerable probabilities in favour of the opinion ; but we are doubtful whether they can be regarded as doing more than this. With regard to the occurrence of suppurative inflammation of the cellular and adipose membrane being associated with erysipelas, it seems rather a violent conclusion to infer that, because these seem to arise under the same circumstances, or follow the operation of the same cause, they are, therefore, the same. If this conclusion be regarded as thus established, then it follows, that erysipelas can no longer be viewed as a form of inflammation proper to the skin, and confined to that membrane ; and it must be admitted not only that it extends to other textures, producing in them peculiar effects ; but that it is merely one of many different forms in which inflammatory action shows itself. If this view be well-founded, we must not only admit erysipelatous inflammation of the skin, but phlegmonous inflammation, and, perhaps, several others, and, consequently, erysipelatous inflammation, and phlegmonous inflammation of the cellular and adipose membrane.

It is proper, nevertheless, on this head to say, that the forty-eighth volume of this Journal contains a paper, by Dr MacLachlan of the 79th Regiment, presenting a series of cases of erysipelas and of diffuse inflammation of the cellular membrane, which occurred in the 79th Regiment in 1837, while stationed in Glasgow, and which took place apparently so much in connection with each other, that they afford evidence of the accuracy of the conclusions of Mr Nunneley much stronger and more pointed than any

that he has adduced. In the first of the cases of diffuse inflammation, (p. 355), the individual, William Wilson, seemed to have been attacked by that disease so manifestly, in consequence of having been exposed to some morbid poison issuing from James Smith, the second case of Rose, that it seems almost an inevitable conclusion. Nay, three other cases of diffuse inflammation followed, in which it was not less manifest that there was every reason to infer, that these had in like manner been produced in the same way from each other, and from the same general cause. Yet, strong as the evidence afforded by Dr Maclachlan's cases is, we do not know that they can be regarded as positively proving the identical origin of rose and diffuse inflammation; and if they do, then the inferences regarding the nature of rose already stated must inevitably follow. It is well known, however, that in disease, the same cause often produces many different effects; and, if all the effects proceeding from or following the same cause are to be regarded as identical or similar, or allied, then all those distinctions which pathologists are in the habit of founding on the peculiarities of texture, the differences and the similitudes must fall to the ground. Meanwhile, it must be allowed, that, in the present state of the question, there is just reason for entertaining the proposition, that diffuse inflammation of the cellular membrane is an erysipelatous form of that disease, and for collecting evidence to determine whether the proposition is founded in truth or in error.

III. Mr Nunneley proceeds next to demonstrate the connection between rose and puerperal fever, and adopts nearly the same method as that already pursued in adducing evidence in favour of this view. This idea is by no means new. For, independent of the notion originally announced by Mr John Hunter, that peritonitis is most commonly a diffusive or spreading and destructive inflammation, Dr Gordon of Aberdeen expressed the opinion that it was analogous to erysipelatous inflammation; and similar views were afterwards taken by Mr Hey and Dr Abercrombie. At a subsequent period the question was considered by Dr Lee, who, however, was rather disposed to adopt the negative conclusion; while Dr Ingleby has adduced a number of facts which are favourable to the idea, that erysipelatous inflammation of the external surface has a pathological alliance with puerperal peritonitis.

Like many other authors, he adverts to the discordant opinions entertained by different physicians on the pathological nature and therapeutic management of puerperal fever. These discordancies, we think, are, if not removed, at least explained by the researches made by the different pathologists of France and England on this disease. The result of these researches has been to show that puerperal fever is not a simple disorder or lesion, but a complex disease, consisting of several simple lesions, and that the main cause

of the various aspects which the disease presents, and of the difficulty of applying to it one uniform method of treatment, is the fact, that it is not at all times, nor in any given epidemic, a set of cases of the same disorder, and that in different epidemics different lesions predominate. We fear, nevertheless, that in this part of his work, Mr Nunneley has shown less deliberation and more precipitancy than in other parts, in either not adverting to this important inference, or in not being aware of it. Puerperal fever is neither always general peritonitis, or uterine peritonitis, or inflammation of the veins of the womb, but it is *peritonitis* with inflammation and suppuration of the ovaries and Fallopian tubes, and sometimes with that of the uterine veins and lymphatics; and it is this complexity of lesion that impresses on the disease its characteristic features, both pathologically and as an object of treatment. It is this complexity of lesion also that appears to us to afford a very great, if not an insurmountable difficulty to the hypothesis of the present author, and to render it incapable of being compared with or likened to any single disease. While we thus think, we are anxious that Mr Nunneley may be fully heard and candidly judged; and, therefore, to prevent the chance of misrepresentation, we allow him to speak for himself.

“1. Puerperal fever resembles erysipelas in the nature of the constitutional symptoms shown throughout the course of the disorder, and also generally in the mode of its onset, as by rigor, sickness, &c. The indications are those of irritation without corresponding power, the pulse is characterized rather by excessive frequency, than by either fulness or hardness. The statement of Dr Lee, that puerperal fever cannot resemble erysipelas, because it may be cut short, while erysipelas cannot be, is of no value; since few, I presume, will be disposed to deny that, if seen early, attacks which, from the symptoms we have every reason to suppose are erysipelas, may often by prompt treatment be cut short.

“2. The local symptoms during life and the appearances after death are, allowance being made for the different situation and textures of the parts attacked, identical, as a comparison of the *post mortem* appearances in puerperal fever and erysipelas will prove: Dr Douglas distinctly states this, and he is certainly an authority on any subject connected with puerperal fever. ‘Now there appears,’ he says, ‘to be a striking analogy between the present malignant fever in Philadelphia, and the puerperal epidemic fevers of the Dublin Lying-in Hospital.’ ‘These physicians (Drs Hewson and Chapman) state that the character of the fever was of typhoid malignity, and that the stomach by examinations, *post mortem*, was found almost exclusively affected with a species of erysipelatous inflammation in various gradations of violence.’ The contagious puerperal fever of Dublin is, I venture to pronounce, neither more nor less than a malignant fever of a typhoid character, accompanied with an erysipelatous inflammation of the peritoneal coverings of the stomach, intestines, and other abdominal viscera.”

“ 3. The treatment in both forms of disease must be guided by the same indications ; as a rule, in the most decided cases, in neither is it proper to employ active blood-letting : our measures must vary in their activity according as the disorders prevail sporadically or epidemically ; whether they approach the form of circumscribed phlegmon with synochial fever, or diffuse inflammation with typhus.

“ 4. Both forms of complaint prevail at the same time epidemically. Of this we have the most abundant evidence. Thus, Dr Gordon, in his account of the epidemic puerperal fever which occurred in Aberdeen, says, ‘ these two epidemics’ (erysipelas and puerperal fever) ‘ began in Aberdeen at the same time and afterwards kept pace together ; they both arrived at their acme together, and they both ceased at the same time.’ Clarke tells us, ‘ that if inflammatory fevers prevailed at all with the low fever of child-bed, they were principally of the erysipelatos kind.’ Mr Hey says, ‘ in towns so large as Leeds there are never wanting cases of infectious fevers ; but at the time alluded to no disease was so prevalent as to deserve the name of an epidemic, except erysipelatos inflammation, which prevailed during the whole period of the puerperal fever, insomuch that I do not recollect ever to have seen worse cases of erysipelas than at that time.’ Ossander states, that infantile erysipelas is more prevalent when puerperal fevers are common. Mr West, in an account of puerperal fever which prevailed in the neighbourhood of Abingdon, says, that in no instance did puerperal fever occur in any village where there were not cases of erysipelas. Mr Ingleby informs us, that in the year 1833 puerperal fever reappeared at Birmingham, at which time erysipelas prevailed generally, both in the town and its general hospital ; and that he is fully authorized in saying almost every wound under treatment in the institution assumed an erysipelatos character, and several of the cases proved fatal. Dr Ferguson declares that erysipelas and puerperal fever are generally coexistent in the General Lying-in Hospital. Dr Hutchinson declares that, in a recent epidemic at Nottingham, the co-incident prevalence of erysipelas and puerperal fever was most marked. Dr Lee states, ‘ in the autumn of 1829, a short time before the epidemic (puerperal fever) broke out in the British Lying-in Hospital, which led to its being closed for several months, two children died of erysipelas. A few days before the re-appearance of the disease in the hospital in December 1830, an infant died of erysipelas of the internal organs of generation and abdomen, and the same diseased state of the abdomen was observed. Another infant was attacked with gangrenous erysipelas of the right fore-finger on the 28th of December, whose mother had been cut off on the 24th by uterine plebitis.’ During the prevalence of puerperal fever, in the winter of 1831–32, two children died from inflammation and suppuration of the umbilical vein, and in both there were patches of erysipelatos inflammation in different parts of the body. Dr Locock’s evidence is to the same effect. He says, ‘ the existence of erysipelas in hospitals, or among the infants where the mothers have puerperal fever, has long been noticed. Many such

coincidences have happened in the General Lying-in Hospital, and servants and nurses even have often been attacked. This has led some to consider the inflammation which occurs in puerperal peritonitis, &c. to be of an erysipelatous character. In those instances in which the morbid appearances consist chiefly of a copious serous effusion, this may perhaps be the case; but we can hardly assent to this doctrine where firm lymph is deposited. The great resemblance between the effects of parturition on the cavity of the uterus, and what takes place after some important surgical operations, amputation for instance, as pointed out by Cruveilhier, would lead one to expect that erysipelas, so common in latter instances, would not be rare in the former.

" 5. Both forms of disease arise under the same circumstances, and prevail most at the same seasons of the year, and during the same kind of weather. It is well known that erysipelas prevails most in close humid weather, particularly if the temperature be changeable, such as is usual in this country in spring and autumn, but more especially the former. And also, it is well established, that a crowded ill-ventilated hospital at these periods of the year is seldom without cases, more especially in the wards where many wounded are collected together; under such circumstances it is, without the greatest caution, almost impossible to prevent its appearance. So it is with puerperal fever. Dr Douglas, after stating that puerperal fever prevails more at some seasons than at others, and giving some statistical details, which prove that puerperal fever has prevailed in the Dublin Lying-in Hospital in nearly exact proportion to its crowded state, adds, 'from the foregoing and other statements, I do firmly believe a crowded state of a lying-in hospital, and a hurried succession of patients, highly conducive to puerperal fever.' The fact of so greatly increased a ratio of mortality from this cause in lying-in hospitals, as is shown by the returns from those of London, Paris, and Dublin, than occurs among women who are delivered at their own homes, is so important, that Dr Lee thinks the loss of human life is at times so great as completely to defeat the objects of the charities. The physician at the Hotel Dieu, M. Vesou, attributed the dreadful epidemic which occurred there among puerperal women in 1664, entirely to the fact of the lying-in wards being situated immediately over those where many wounded persons were collected together.

" 6. Both complaints are characterized by the great disposition there is to the deposition of purulent matter in various parts of the body; it has already been stated that deposits are found in the abdomen, pericardium, and pleuræ after puerperal fever. Dr Lee tells us (evidence which is amply confirmed by the testimony of the best obstetric practitioners, as Dr Ferguson and others,) that the presence of abscesses in any part of the body of a woman who has recently been delivered, is one of the strongest proofs which can be obtained of the previous existence of inflammation of the deeper seated textures of the uterine organs; and, 'that deposits or infiltrations of purulent matter, of enormous extent, also take place in-

to the cellular membrane, between the muscles of the extremities and often in the neighbourhood of the joints ; the cartilages of the joints themselves become ulcerated, and purulent matter is formed within the capsular ligaments.' Now compare this with the appearances after erysipelas as related in other places in this essay, and also with the following passage from Dupuytren's *Leçons Orales*. ' More than one-half of those who die from phlegmonous erysipelas fall victims to affections of the pleura, liver, or other internal inflammations ; so great is the disposition to the formation of purulent matter that there exists among these patients 'une véritable puogénie.' That these purulent depositions depend upon a common cause in both affections, cannot, I think, be doubted, nor does it alter the relation between them, if we suppose it to arise from a true inflammation of the veins themselves, as Dr Lee and M. Ribes would assert ; if with M. Andral we imagine that the veins in passing through a depot of purulent matter absorb some of it, and subsequently this same purulent matter is again separated from the mass of blood into the places where it is found lodged ; or if we with Mr Arnott believe that, although these collections of purulent matter are caused by purulent matter being introduced into the venous circulation, yet that the matter deposited is not that which has originally been introduced into the blood. Which of these opinions may be preferred, will in no measure alter the case ; the facts remain equally connected and applicable to the two forms of disease, whether we infer that the disease essentially depends upon the venous inflammation or not. To me, however, it appears highly probable that the two forms both depend upon some less palpable cause, which in each is the same, and which has hitherto, in the hunt after change in the solid textures, been forgotten or overlooked, viz. change in the circulating fluids, whose vitality is impaired. It is also remarkable that the blood, both in erysipelas and puerperal fever, is found to be similarly changed as though mixed with some foreign matter, and decomposition in both cases takes place earlier than usual.

" 7. The great danger attending inoculation with the effused fluids, in the examination of the bodies of those who have recently died of puerperal fever, with the almost immediate development of erysipelas in the member inoculated, has already been somewhat at length stated. Now, although from the fact of similar results succeeding other causes, as well as arising idiopathically, we are not justified in assuming this as a positive proof of identity in the two forms ; it is not without its weight when taken into connection with other facts.

" 8. The two forms of the disease may exist at the same time in the same patient. I might here refer to the erythematic patches which so often accompany complaints of an adynamic type, as well as to the forms of erratic erysipelas, (which all admit to be genuine,) in which, in many cases, the external affections constitute but a very unimportant part of the disease, did we not possess evidence of the most positive character, as to the coëtaneous existence of external

erysipelas and puerperal fever. Thus, we are told of the sufferers in the puerperal epidemic at Vienna. 'That the greater number brought with them into the hospital erythematic spots in the hands and feet, chiefly upon the joints.' Dr Johnstone (of Birmingham) has not only adverted to the connexion between erysipelas and puerperal fever, but has also related a case in which erysipelas appeared on the arms of a patient affected with this fever the day preceding her death. So also Dr Hutchinson, of Nottingham, has recently mentioned two cases. In one instance of puerperal peritonitis, erysipelas began in the left labium pudendi, and extended over large surfaces of the body, accompanied with vesications and sloughing of the cellular membrane; in the second case there were repeated alternations of puerperal peritonitis, and erysipelas on the surface. Dr Copeland's evidence of the occurrence of puerperal fever and diffuse cellular inflammation, in lying-in hospitals, has already been referred to, and even though it should not be admitted, as proof of erysipelas and puerperal peritonitis, the instance of Dr Hutchinson cannot be objected to, for there erysipelas appeared in its most orthodox form with vesications.

"9. That puerperal fever and erysipelas may, during life, mutually produce each other in a second person, there appears to be evidence of the most indubitable nature. This is evidently a question of facts, and as it is a most important one, I shall bring them from different quarters; because, although a very few instances, if well authenticated and correctly observed, would be sufficient; yet, in questions of this nature, where many circumstances may occur to interfere with accuracy, it is well to have evidence from various and distinct sources, inasmuch as we then cannot attribute the occurrences to mere accidental coincidences, nor to observations made through the strongly coloured medium of preconceived opinions and predilections. In more than one disorder, where there is much variation in the symptoms, the proof of propagation from one to another is always regarded as conclusive. Upon what other evidence does the identity of small-pox in its mildest and most confluent forms, or of scarlatina as often seen, and malignant sore throat depend? If the evidence be sufficient in one case, why is it not in another?"—Pp. 73–81.

From these facts and arguments Mr Nunneley draws the conclusion, that puerperal fever is only one form of diffuse inflammatory action, which, when it is exhibited upon the surface of the body, is called erysipelas; in other words, puerperal fever is erysipelas of the peritoneum, general and uterine, erysipelas of the ovaries, erysipelas of the Fallopian tubes, erysipelas of the uterine veins and lymphatics, and in some rare occasions gangrenous erysipelas of the womb itself. In short, this hypothesis requires that every lesion observed in the persons of females destroyed by puerperal fever should be erysipelas of the parts so affected. It is only requisite to consider how this accords with observation, and

how it suits with the doctrines usually taught of morbid action and its effects.

IV. The next disease which the author refers to the head of rose, is what he denominates diffuse inflammation of the peritoneum, pleura, and other serous membranes. After what has been already said by the author on the alliance between puerperal fever and rose, there appears no great difficulty in establishing the alliance between rose and certain forms of peritonitis; because, as the less is always included in the greater, and as peritoneal inflammation of some kind forms generally one of the lesions in puerperal fever, it is easy to see that, if the reasoning be well founded as to the latter disease, it must be *a fortiori* well founded as to peritoneal inflammation. There is, in truth, much less intrinsic difficulty in this part of the subject, in so far as many authors from Mr John Hunter downwards have admitted the existence of a diffusive, disjunctive or spreading, and destructive action in certain forms of peritoneal inflammation. The following extracts convey in short compass the views adopted by the author:

“1st, That puerperal peritonitis is not a specific disease, and that it is not confined to the lying-in state, nor even to females; and that it cannot be distinguished either during life by the symptoms, or after death by the appearances, from diffuse peritonitis, which happens under other circumstances; and 2d, That this form of inflammation of the serous membranes is intimately connected with external erysipelas.

“1. That the inflammation of the peritoneum which occurs in the puerperal state is not peculiar to it, we have the strongest evidence for believing,—the testimony of the senses; the only means by which we originally gain information respecting disease, or any thing else. If it can be clearly demonstrated that any peculiar features, either in the symptoms during life, the appearances after death, or in the effects of remedies upon the course of the disease, distinguish the inflammation of the serous membranes in women in child-bed, then we are justified in continuing the present notions of its nature, and designating it by the term puerperal, or some corresponding word; but if, on the contrary, neither the symptoms during life, the *post mortem* appearances, nor the effects of remedies upon the course of the disease, differ in any essential particulars from complaints, as exhibited in other states than the puerperal, then we are not justified in speaking of it as a specific disease, being only developed in one condition of the female system. Now, although it is commonly assumed and spoken of as a disease peculiar to the puerperal state, I am not aware that it is any where on competent authority asserted that such is in reality the fact, or that any one has attempted to point out the distinctive marks, with the exception of Dr Lee, who would regard inflammation of the uterine veins as pathognomonic; but even he does not attempt to show that the condition of the peritoneum is confined to puerperal fever; and as we

have seen, this condition of the veins is not in reality necessary to the existence of the disorder. Also, if it were, it would not be sufficient to insulate the affections from all other morbid states, since equally good observers have regarded external erysipelas as depending upon the same inflamed condition of the veins. Indeed, so complete is the resemblance in every respect, from the commencement to the termination, as well as the effect of remedies upon them, that to me it appears evident that two persons, say, the one, a woman suffering from puerperal fever, the other, a man labouring under that form of peritoneal inflammation, in which the effusion is of the non-plastic kind, which is sometimes developed after an operation for strangulated hernia, or stone in the bladder, are both suffering from the same complaint. Moreover, that if we did not approach the bed-side of the female with the previous knowledge of her recent delivery, we should not discover it from her condition, unless from knowing that women are, under such circumstances, exposed to be so affected; or, to state the proposition conversely, if we were called to the bed-side of a perfectly strange female, of whose previous history or symptoms we knew nothing whatever, and who was suffering under this complaint idiopathically developed, should we not make the inquiry if she had recently been delivered? If answered in the affirmative, would not our diagnosis be puerperal fever; if in the negative, diffuse peritonitis? Yet the disease would be the same in its nature, and ought to receive the same treatment."—Pp. 90–92.

To us it appears that the statements now made regarding peritoneal inflammation, and the absence of specific action in puerperal fever, are in some sense at variance with the views adduced under the last head. We must remark that we say nothing as to the specific character of the inflammation in puerperal fever. Perhaps we are not inclined to believe in such an idea. Perhaps we see no proof of the existence of any thing specific. Perhaps we think that all the apparent specific, or peculiar phenomena, in puerperal fever, depend on the multiplicity of lesions, and, above all, on the venous and lymphatic inflammation. But it is different with Mr Nunneley, who argues, if not strenuously, at least like one who sincerely believes in the opinion, that the phenomena of puerperal fever depend on the operation of a morbid poison. In this section the author begins with denying the presence of any specific action in puerperal peritonitis, and says, that it is nothing more or less than diffuse peritoneal inflammation, or what he terms erysipelas of the peritoneum. The author may be perfectly correct in the conclusion now deduced; nay, we go so far as to say, that we think there is much probability in the view that the inflammation of the peritoneum in certain forms of puerperal fever is quite analogous in its diffusive character to erysipelas externally. But we cannot help saying that there is here some inconsistency with the statements in the last section; and further, that, if the

conclusion be well-founded, that the inflammation of the peritoneum is spreading and diffuse, this does not explain the occurrence of so many different lesions as are usually found in peritonitis. Lastly, we must add, that we have seen fatal cases of puerperal fever; that is to say, of disease with all the symptoms of puerperal fever, yet without peritoneal inflammation at all, and with merely suppuration of the Fallopian tubes.

In the following extract Mr Nunneley expresses his views of the multiform nature of erysipelas, and of its relation to peritonitis, simple and puerperal, still more decidedly than he has hitherto done; and it is manifest that, as he proceeds in his argument, he becomes more convinced of its truth and more confident in expressing this conviction.

“2. That this diffuse peritonitis is most intimately connected with erysipelas few will deny, and that inflammation of the internal serous membranes frequently supervenes upon external erysipelas is well known,—but then it is not erysipelas, it is said. If by erysipelas be meant inflammation of the skin alone, this is self-evident, but if it be meant that the disorder is no longer of the same nature, I ask for the proof of its difference. If occurring at the same time; alternating with the external affection; being accompanied by the same general symptoms; having, as far as the situation and structure of the parts allow, the same local symptoms; producing the same results; and requiring the same treatment: moreover, one form of the complaint producing the other form in a second person, be decisive of identity of nature, then, most assuredly, these two forms are but varieties of one disease. I might fairly refer to the preceding statements respecting the concurrent existence on the one hand, of puerperal fever and erysipelas; and on the other, of the identity of puerperal fever with diffuse peritonitis occurring under other circumstances than recent delivery; because, if these two propositions be correct, then also the third, viz. that diffuse peritonitis and erysipelas are the same disease, must be admitted.”—Pp. 95–96.

In estimating the force of the arguments adduced in favour of this part of the general proposition, one point deserves consideration. Many writers, from Hippocrates downwards, have spoken of internal rose in contradistinction to the external, and have inculcated the great danger and fatality of the former compared with the latter. “*Erysipelas foris quidem*,” says Hippocrates, “*intro verti non bonum; intus vero foras, bonum*.”

“Lastly,” says Hildenbrand, “we must here mention metascasematisms, by means of which rose may pass into various evils. It happens, for instance, that the morbid symptoms in the original seat of the erysipelatous inflammation may suddenly disappear, yet with the fever continuing, and even becoming more intense, or presenting a nervous character, and may appear anew in another part, either of the skin or in some of the internal organs, either of analogous or totally different structure. We have elsewhere said

that these metastatic inflammations of the intestinal organs cannot be regarded as erysipelas, but are to be considered as vicarious, or substituted for that distemper; the inflammatory process being modified by the texture and nature of the organ, which, in the mucous membranes, approaches the catarrhal character, and in the serous the rheumatic. So far as the dignity of the internal organs is in the animal economy greater than that of the external covering, so far all metastases infer great danger, especially if these be directed to the membrane of the brain, the lungs and pleura, the pericardium, the stomach or bowels,—by inducing different symptoms, according to the difference of region, as delirium, sopor, difficult breathing, asthma, vomiting, cardialgia, colic pains, &c.*

V. In the next section on Diffuse Inflammation of the Mucous Membranes, there is both much less novelty, and, at the same time, the facts are such as have been long more or less generally admitted by physicians and pathologists. A diffuse or spreading inflammation of these membranes in various regions of the body, more especially in the throat, œsophagus, and stomach, has been long taught as a received doctrine; and the resemblance of this to rose of the skin, and its occasional connection with that disease, have been observed by many authors. Among other forms of inflammation of the throat, the author refers to this head what he terms syphilitic inflammation; and we have no doubt that this may be correct. A greatly more common sort of erysipelatous inflammation of the palate, uvula, and fauces generally, however, is that induced by mercury given so as to affect and saturate the system. This sort of erysipelatous inflammation of the throat may be seen daily in this and other large cities; and, so far as our experience goes, it is the most usual form of the disease. It is easily recognized by its peculiar colour, and a certain velvet-like or villous aspect of the membrane of the throat. It advances rapidly to ulceration. But it may be immediately and effectually stopped by the free application of nitrate of silver, the external use of a blister, and the exhibition of cathartics. To this and similar forms the author afterwards refers at p. 112.

It is rather singular that Mr Nunneley omits to refer to this head of rose of the mucous membranes, the *Erysipelas pudendorum ulcerans*, which is manifestly a variety of the same distemper. With this exception, however, the description of Mr Nunneley is ample, accurate, and instructive.

VI. Next comes *Arachnitis*, as a disease presenting the diffuse or spreading character. As, however, the observations on this present nothing very peculiar, we proceed to the next head.

VII. This consists of Diffuse Inflammation of the Veins and Lymphatics. The author begins with the observation, that the veins

* *Institutiones Practico-Medicæ*, Tomus ii. Viennæ Austriæ, 1833, p. 123.

and lymphatics are liable to inflammation in two forms, one circumscribed and limited, another spreading and diffused. In the first, he properly observes, the local mischief is limited and attended by symptoms of phlegmonous abscess; in short, lymph is effused, and the action is bounded or prevented from spreading. In the second, on the contrary, the inflammatory action sweeps along the inner surface of the veins with great velocity, and causes the secretion of purulent matter whenever it appears; little lymph is formed; and if it be, it is inadequate to stop the progress of the morbid action. In the first also, the general or febrile symptoms, Mr Nunneley infers, belong to synocha, or partakes of the genuine inflammatory character, with pretty distinct marks of vascular action. In the second, the febrile symptoms are of the typhoid or adynamic class, or, in short, present marks of debility and prostration of the vital powers. To the first head he refers, the limited and circumscribed abscesses at the bend of the arm after blood-letting, the cure of varix by ligature or caustic, and the suppuration of a neighbouring lymphatic gland ensuing from a neglected scratch of the hand or foot. To the other belong all those cases of fatal inflammation of the veins which occur in different cases afterwards.

Mr Nunneley then undertakes to establish the identity, or at least the similarity of diffuse *phlebitis*, and *angioleucitis*, in the latter sort of disorder, to rose, by the following series of arguments:

“1. The facts of the gradual merging of phlebitis from the limited into the diffused, in which successive changes the symptoms and effects bear the strictest analogy to the gradual progression from phlegmonoid to erysipeloid inflammation.

“2. The constitutional, and not unfrequently the local, symptoms of phlebitis and erysipelas are so similar, that the best observers have been mistaken in their diagnosis. Thus, Dr Duncan has related at length a case of phlebitis, which he thought to be phlegmonous erysipelas, and treated it as such; it was only after death, on examining the parts, that he discovered it to be phlebitis. And if we turn to the cases related by the same gentleman, under the denomination of diffuse inflammation of the cellular texture, it will be apparent that in some the veins were the parts in which the mischief primarily occurred, and that they form well-marked instances of what others regard as pure phlebitis. What is also to be remarked is, that where the disease arose under precisely the same circumstances, as from venesection, and was attended by the same symptoms, after death the vein in one case was found to be principally affected, in another there was no inflammation of the vein, no thickening of its coats, or effusion into it of coagulated lymph or purulent matter, but instead there was diffuse cellular inflammation; so also in another case the vein was perfectly healthy, and appeared not to have participated in the slightest degree in the surrounding disease; its internal surface was white, and its tunics sound and healthy. The same discrepancy will be found in the cases related by other observers.”—Pp. 122–123.

“ 3. The great disposition there is in erysipelatous inflammation for the deposition of purulent matter in different organs, without any manifest disorder in their functions, as well as for distant parts of the body to exhibit inflammatory action and the formation of imperfect purulent matter, has already been alluded to ; and it is well known that this same tendency is, more than any other sign, to be relied on as characteristic of the presence of phlebitis, as the cases related by Lee, Arnott, and many others, sufficiently show. Now, although the assertion of Ribes, and others, that external erysipelas essentially consists in inflammation of the cutaneous and sub-cutaneous veins, and that in all cases they contain purulent matter cannot be admitted as true, inasmuch as other observers, as Rayer and Velpeau, have often not been able to find it ; yet is it certain, that not unfrequently the veins do contain purulent matter ; and farther, as the cases of Dr Duncan, just referred to, prove, we may have the symptoms of phlebitis present, and yet no purulent matter be found in the veins, or their tissue in any way altered. These facts are sufficient to show the connection between the two forms of disorder, and that both depend upon some more general cause than is yet described. So also, although the opinion of puerperal fever being neither more nor less than inflammation of the uterine veins is not correct, the very frequent existence of it is a confirmation of the connection and similarity in nature in the two, more especially as the symptoms in puerperal fever are of the same character, whether the veins be inflamed and contain purulent matter or not.

“ 4. The development of erysipelas and diffuse phlebitis both depend upon constitutional causes, more than the immediate exciting local cause ; inasmuch as both may arise idiopathically ; and although inoculation with matter generated under the action of analogous complaints has a great tendency to induce one or the other form of disease ; yet, except in a few instances, as the bites of the more poisonous animals, they are not produced in an equally decided form in all cases, even where the immediate exciting causes are identical ; as in the instance of two persons being inoculated while examining the same body ; and farther, precisely the same derangements and disorders of the system dispose to both complaints.

“ 5. The same condition of atmosphere conduces to erysipelas and diffuse phlebitis. Thus, Dr Duncan's cases occurred at the same time, and in the same place, as his other cases of cellular inflammation, and when ordinary erysipelas was very prevalent ; and the three first cases related by Mr Arnott all occurred within seven weeks of each other, in Bartholomew's Hospital. Puerperal fever, as I have fully shown, prevails when other forms of erysipelas are rife, produces them and is produced by them.

“ 6. In both forms of the complaint there is the same tendency for the serous membranes to become affected. It is very rare after death from diffused phlebitis, not to find the pleuræ or peritoneum affected, often both, but especially the former.

“ 7. One form of complaint is very liable to produce the other ;

some of the worst cases of mischief following wounds, have been where the injury has been received in the inspection of those who have died from phlebitis ; not only uterine, but of the veins of the arm, occurring after venesection.

“ 8. There is a strong resemblance in the appearance of blood after death, from these complaints. The blood is generally semifluid, much altered in characters, and the lining venous membrane, even to the heart, is often stained of a deep dark-red colour.

“ 9. The treatment, both local and general, is the same.”—Pp. 125–128.

The whole is then wound up by the following observations :

“ It seems highly probable, if not absolutely certain, that in phlebitis, erysipelas of the integuments, and other extensively diffused inflammations, some change is induced in the blood, which we can only partially recognize by its appearance and effects, and that in all these cases the change is of the same nature. For I think, when we consider how identical the general and local symptoms of disease may be, and yet after death the varying condition of parts found ; how much symptoms during life may vary, the appearances after death being nearly the same ; and how one form of diffuse inflammation seems to give rise to others, it must be admitted as certain, that what we are frequently in the habit of regarding as the immediate cause of a disease, is in reality only a remote one, or possibly only an effect of some preceding and more important cause. We see changes in particular organs and separate tissues, and immediately suppose the diseases to be essentially distinct from each other ; yet there is nothing improbable or irrational in the idea, that they are only instrumental in affecting the general symptoms by some farther change they may produce, according to the extent to which these organs are involved, or the influence their functions have upon the system in a healthy condition ; the local changes themselves being the sequents and consequences of some prior alteration, which has been effected upon the system generally, or upon the part itself. This change will probably be greater and may be so much the more readily developed, in proportion to the connection the part has with the nerves or the circulating fluids. Thus, in the case of the veins, if there prevails but a very slight tendency to this diffuse inflammation, it may be easily induced, as by venesection, which, if this tendency had not existed, would have been followed by no ill effect, or the cause itself may be so powerful that, under all circumstances, and in all conditions of constitution, wherever it may be applied, the most violent and fatal diffuse inflammation shall be immediately set up, as from the bite of the rattlesnake ; while, on the contrary, it requires very great constitutional aptitude towards the development of this form of disease, in order that it may be excited by the sting of a hornet or scorpion, a contused or a lacerated wound. So that I imagine the presence or not of purulent matter in the veins, should not be regarded as determining the existence or not of erysipeloid diseases ; the complaint may in reality be the same, whether purulent matter be present in them or not ; if it be present the disease will then be the more rapid and fatal, because

it, becomes a secondary cause, continually augmenting the primary disorder, by the immediate and direct effect it has upon the blood circulating within the vessels, and with which it is carried to all parts of the body. This secondary effect will be much the same, whether the purulent matter enter the veins by absorption by the veins themselves, or by the lymphatics, or whether it be actually formed within the veins or lymphatics. There can be little doubt that purulent matter exists in the veins from both causes. It is perfectly true that purulent matter, when confined in a circumscribed cavity, may be a bland innocuous fluid, but I am by no means disposed to agree with Mr Travers, that it would retain this harmless character when mixed with the blood; on the contrary, there seems from recent experiments, reason to suppose that the admixture of purulent matter with the blood is always attended with the most serious disturbance. How far it may be the same purulent matter which has been mechanically mixed with the blood, that is deposited in the different organs, as was formerly commonly supposed, and which opinion Andral still retains, or whether, as Hunter supposed, it be a formation *de novo*,—the re-deposition of absorbed matter being impossible, interesting as the question is, this is not quite the place to enquire into at any length: certain it is, that whenever purulent matter does become mixed with the blood, there exists a great disposition for matter to become disseminated through every part and tissue of the body; and, at the same time, for a typhoid depression to be evinced.

“Whether this view of disease, which would tend to classify and unite under groups congenerous affections, be correct or not, this seems to be proved, that in perfectly orthodox and well-marked cases of cutaneous erysipelas, purulent matter is sometimes found in the veins and absorbents of the inflamed part, at others it is not found, and that there are no symptoms by which, during life, the two conditions can be distinguished from each other; that in other cases which have, during life, possessed all the symptoms of erysipelas, so as to lead the best observers to treat them as such, after death the veins have been found to be the seat of disease; and in other cases where, during life, the symptoms have been the same, in some the veins have been principally affected, in others they have been healthy; and again, in puerperal fever, in many instances phlebitis prevails, while in other cases it is not found to exist, the symptoms being the same during life, this knowledge being only with certainty arrived at after death; from which it may, I think, be fairly and legitimately concluded that the essential difference between the physiological and pathological conditions, which constitute health and disease, depend upon changes which are yet not recognized, but which probably are more general than is commonly supposed. That they do not solely nor primarily depend upon the tissue or function of the part where the local action may happen more immediately to be thrown, is certain, as the restriction of erysipelas to the skin implies.”—Pp. 128—131.

This may be regarded as the amount of the evidence adduced by Mr Nunneley in support of the proposition that, 1. Diffuse

inflammation of the cellular and adipose membrane ; 2. Diffuse or suppurative inflammation of the serous membranes ; 3. Puerperal fever ; 4. Spreading inflammation of the mucous membranes ; and 5. Spreading inflammation of the veins and lymphatics,—are all the effects of erysipelatous inflammation in these respective tissues. It cannot be denied that this evidence is both imposing and forcible as to the first, second, and fourth members of the category ; but perhaps doubtful whether it be conclusive. As to the third and fifth, much will depend on the weight of individual observation, and much as to the sense in which the term diffuse inflammation is to be understood. It must be allowed, nevertheless, that Mr Nunneley has adduced a body of evidence which will enable readers to determine the question for themselves, guided as they must henceforth be by the views which he has promulgated. The author has neglected no means by which his doctrine could be illustrated ; and there is no doubt that if he has not proved it positively, he has invested it with a high degree of probability.

The part of the work which we have now considered is that which presents the greatest degree of novelty and originality. But it is necessarily argumentative and speculative. That which follows, though less original, is more strictly practical. It is indeed the application of the doctrines of the preceding part of the volume.

The author considers, first, the causes of the disease, and enumerates in successive order all those circumstances to which the occurrence of the disease had, at different times, by different authors, been ascribed. It is manifest that of these circumstances some reside in the persons of those attacked ; others are internal, or operate from without. Of the former are certain states of the system, as shown by the frequent occurrence of the disease in the persons of the same individuals, gastric, gastro-hepatic, and gastro-enteric congestion and irritation, menstrual or uterine disorder in females, and the presence of granular disease of the kidney. Among the latter may be enumerated cold applied in different modes ; scratches, punctures, lacerations, and similar injuries, and a peculiar state of the atmosphere. To these the author adds contagion, and is rather a confident advocate for the operation of this agent.

He then proceeds to give the nosographical description of the disease agreeably to the views which he has explained in the previous part of his volume. He here proposes that the nosologist should distinguish inflammation into two forms—the erysipelatoid and the phlegmonoid ; and the former into two genera, (we presume he means orders) viz. internal and external affections. The internal he proposes to divide into three species ; 1. the serous ; 2. the mucous ; and 3. the vascular, including the veins and lym-

phatics. The external erysipelas he also distinguishes into three varieties, viz. 1. the cutaneous or common rose of the skin; 2. the cellulo-cutaneous, or phlegmonous rose; and 3. the cellular variety, or the diffuse inflammation of Dr Duncan; the inflammation of the adipose membrane of Dr Craigie. A tabular view of these forms, which will convey a clear idea of their relative position, may be given in the following manner:

Erysipelas or Erysipelatous inflammation.	I. Affecting internal tissues and surfaces.	A. The serous membranes, <i>pleura, peritonæum, &c.</i>
		B. The mucous membranes, mouth, palate, <i>fauces, pharynx, vagina.</i>
		C. Vascular system. { <i>a. Veins, (Phlebitis.)</i>
	II. Affecting external tissues and membranes.	{ <i>b. Lymphatics, (Angioleucitis.)</i>
		A. The cutaneous system.
		B. The cutaneo-cellular tissue.
		C. The cellular tissue.

The author confines his attention chiefly to the varieties of the latter class; and of these he gives a most accurate and useful description. He also shows in this account intimate acquaintance with the labours and researches of his predecessors and contemporaries. He next proceeds to give an account of the rose in newborn infants, a disease which has excited much inquiry, especially on the continent. After this, the diagnosis of erysipelas from other distempers, the prognosis and the circumstances on which it is founded, and the morbid anatomy of the disease come successively under review. The main point under the latter head is the fact previously noticed by Joseph Frank, that very rarely are the internal organs found free from disease; and in most cases of fatal rose, one or more of the internal organs of the head, chest, or abdomen have presented distinct marks of inflammatory disorder. The most common, perhaps, is the circumstance of purulent deposits, as they are termed, within the pleura or the peritoneum, or sero-purulent fluid accumulated within these membranes. Purulent matter has been found in the liver; but, perhaps, this is where the disease is complicated with inflammation of the veins or lymphatics. In several instances we have found fatal rose of the surface connected with granular degeneration of the kidneys.

The rest of the volume is occupied with the treatment required for the different forms of erysipelas; and here the author considers at great length, and with much care and judgment, under the two heads of general and local treatment, the therapeutic powers of blood-letting; tonics and stimulants; emetics, purgatives, mercurials, diaphoretics, and diuretics; colchicum, digitalis, and antimony; narcotics; and turpentine and camphor; and afterwards local bleeding by cupping, leeches, punctures, and incisions; cold lotions, stimulants, farinaceous powders, and raw cotton, warm fomentations, and poultices; ointments, mercurial ointment; actual cautery, blisters, and the application of the nitrate of silver, the use of tincture of iodine; and bandages.

It would occupy a great deal too much of our space and of the time of our readers, were we to follow the author on the details into which he has entered on the merits real, or supposed, of each remedial measure. It is enough to say, that he has presented his readers with much useful information, and has endeavoured to specify those circumstances requiring the use of the different remedies employed.

Mr Nunneley next considers shortly the application of each set or order of remedies to each of the varieties of external erysipelas. This is often a difficult and delicate task, in so far as in two of the forms, the cellular and cutaneo-cellular, remedies are often of little avail. The instructions given in this work, however, will be of much use to the physician and surgical practitioner, in enabling them to understand the circumstances most particularly requiring each measure.

From the account now given, our readers will understand, and be enabled to appreciate the merits of this work. To all classes of the profession it is strongly recommended as containing the most ample and systematic view of the question, whether Rose is a peculiar form of inflammation affecting different tissues, or is merely a form of inflammation of the skin. In a practical point of view, also, it must be allowed to possess great merit; and it must be admitted that, while the author has considered carefully the pathological and doctrinal points, he has been not less solicitous to establish their bearings in improving the treatment of the disease.

ART. V.—1. *Die Lehre von den Zeichen, Erscheinungen, und der Dauer der Menschlichen Schwangerschaft, so wie von den phänomenen einen überstandenen Geburt.* Von W. F. MONTGOMERY, M. M., M. D., M. R. I. A., &c. Uebersetzt von Dr F. J. SCHWANN, Practischen Aerzte, Wundärzte und Geburtshelfer. Einleitend bevorwortet von Dr H. F. KILIAN, Ord. Offentl. Professor der Geburtshilfe und Geburtshulfflichen Klinik und z. w. Bonn, u. s. w. Bonn, 1839. 8vo. Pp. 418.

The Exposition of the Signs, Phenomena, and the duration of Human Pregnancy, as also of the marks of Delivery. By W. F. MONTGOMERY, A. M., M. D., &c. Translated by Dr F. J. SCHWANN, Physician, Surgeon and Accoucheur at Bonn, with an Introductory Preface by Dr H. F. KILIAN, Ordinary Public Professor of Midwifery, and of the Midwifery Clinical Establishment at Bonn, &c.

2. *An Exposition of the Signs and Symptoms of Pregnancy, the Period of Human Gestation, and the Signs of Delivery.* By

W. F. MONTGOMERY, M.M. M. D., M. R. I. A., Vice-President and Professor of Midwifery in the King's and Queen's College of Physicians in Ireland. Philadelphia, Carey, and Hart. 1841. 8vo. Pp. 220.

IN our forty-eighth volume was given a full and detailed account of the treatise of Dr Montgomery at the time when it appeared as a separate and complete work in this country. The American edition is an exact reprint without note, commentary, or addition, and therefore, as it gives us no occasion to make any critical remarks, we merely mention its existence, to show the high estimation in which the work of Dr Montgomery is held in the United States.

The German edition requires and deserves a little more ample notice. It consists of a translation of the original work of Dr Montgomery by Dr Schwann of Bonn. But, besides this, we have a very excellent and judicious preface or introduction by Dr Kilian, the Professor of Midwifery at Bonn, and a full and detailed index of the whole contents of the work.

In the introduction, Dr Kilian explains the reasons which induced him to recommend to his countryman, Dr Schwann, the duty of translating the work of Dr Montgomery. Many of the reasons must be so obvious as to be readily anticipated, and scarcely to require mention. The most prominent of these are the great vagueness and uncertainty of the accounts given by many authors of the signs of pregnancy, and the consequent difficulty of applying them confidently in any given case, the manifold pathological states liable to be confounded with pregnancy, or to complicate that condition, excluding those defects of ocular inspection or tact which are incidental to many otherwise able practitioners. No one, indeed, who has much practice, or is consulted much, can be ignorant of the difficulties with which the task of determining the presence or absence of pregnancy in any given case is encompassed. Some of these difficulties belong to the subject and are inseparable from it, as those which arise from various diseased states of the abdomen and pelvis, or the abdominal viscera, simulating pregnancy. Others are adventitious, and are occasionally the result of the wish of the patient or her friends to deceive,—in some instances denying the state when it is actually present,—in others, pretending pregnancy when it is not the case.

Dr Kilian appears to have been most perfectly aware of the difficulty of the diagnosis of pregnancy when the work of Dr Montgomery appeared in 1837; and he tells us that he thought it would be no unacceptable service to his countrymen, when he invited a person acquainted with the subject and the English language, viz. Dr Schwann, to undertake the translation of the work into German.

In the further consideration of the subject, he is led to offer some observations on the present state of knowledge on this branch of obstetrical diagnosis, on the comparative value of the certain and uncertain signs, and of the means most likely to rectify mistakes, exclude fallacies, and obviate illusions. The signs denominated certain, he allows, in some instances of pregnancy, fail altogether; and, on the other hand, the uncertain signs may all be omitted, when the female has no ovum in the womb. But he who studies the subject, ought to recognize in this ambiguous condition of matters no ground for complaint, but rather an inducement to redoubled precaution, and to increased diligence and expertness in observation.

The uncertain symptoms of pregnancy, he adds, may be useful to the physician, in the following concurrence of circumstances; 1. when they are associated in a considerable assemblage; 2. when they take place as a manifest consequence of sexual intercourse; 3. when they are ascertained not to be the result of morbid influences; 4. when they appear in the female as an unexpected, new, and unusual event; 5. when they are not fleeting and transitory, but of a certain duration; and lastly, 6. when they return in periodical and very regular fits.

The certain symptoms are of fixed value only in one direction, as it may be said. He maintains that it must never be lost sight of as a sort of law, that any individual symptom may be employed as evidence, when it is really present, but if it be wanting, it never ought to be employed as evidence on the opposite side. For instance, if, after internal and external examination, in any given case, any part of the child has been recognized, it is impossible in that case to entertain any further doubt of the existence of pregnancy. But when, among a great number of other ambiguous symptoms, no trace of the body of the *fœtus* can be found, this circumstance would only with the experienced be sufficient to authorize well founded doubts, but never to justify completely positive language, and much less the total contradiction of the inference. To remove this doubt, the information afforded by auscultation and the motion of the infant may occasionally be available. But it would appear from the statements of Dr Kilian, that even this simple method is erroneously used, though upon its correct employment depends the continuance of life and health. He justly adds, however, that it may be laid down as a rule on this point, that wherever the certain symptoms of pregnancy cannot be discovered, the practical accoucheur must either allow time to decide the question, or must be satisfied with the attainment of the degree of probability suited to the case; and in the meanwhile he ought to employ no method of treatment which might be injurious or fatal either to the infant, if such there be, or to the mother.

The necessity of these precautions is so obvious as to require to be merely mentioned in order to be fully admitted. A young female in whom menstruation has been suspended for some three or four months, and who finds the belly becoming large, applies, as is often the case, to a medical practitioner, in order to have the uterine secretion re-established, and the abdominal swelling removed. She may either not form or not express any opinion upon the cause of the abdominal tumour; or she may say that it is dropsical, and in this she may obtain either a careless or a willing hearer in the medical practitioner to whom she applies. He gives emmenagogues and diuretics; and sometimes mercury is exhibited after other remedies have been tried in vain. The abdominal enlargement, nevertheless, proceeds; and in three or four months more the female gives birth to a child either dead or so much emaciated that it does not survive. Her own health also sustains a shock sometimes irreparable, from the conjoined effects of the use of mercury, and the injury done to the womb and its contents. This is not an imaginary case; but one which we have known to take place more than once.

The counterpart is the following. A young female with suppressed menstruation and abdominal enlargement, supposing she has dropsy, applies first to one medical practitioner, who gives her medicines, probably not very energetic, to restore the secretion, and diminish the swelling. Disappointed, however, in speedily attaining the object of her wishes, she applies with the same intention for admission into a public hospital. From the complexion and look of the patient, which is not quite like that of ascites, either alone or complicated with amenorrhœa, and the suspicious feeling of a firm hard ovoidal tumour in the hypogastric region, the abdomen is examined by auscultation, and there are heard, not only the peculiar thrills of the placental murmur, but the quick, small, rapid beat of the foetal heart, and occasional shocks of the limbs of the fetus, against the ear of the observer. The case is explained confidentially to the assistants and pupils, who easily recognize the same facts. Nothing is said to the patient calculated to excite her suspicions. Very simple medicines are given, with the view of keeping the bowels simply regular, and obviating plethora; and in due time the patient gives birth to a healthy living child, without injury to her own frame.

There is still another case in which it is requisite to be not less circumspect in forming an opinion. A female, unmarried probably, with menstruation suppressed for some months, and enlargement of the abdomen, gradually and progressively increasing, applies for advice. From various circumstances this may be inferred to be also pregnancy; and we have known and seen cases in which rash, ignorant, or malignant persons fabricated and propagated reports most injurious to the character of the patient. But the most careful examination of the tumour by auscultation does not

allow of the slightest indications being heard, except some occasional motions, which are liable to be taken for the motions of the limbs of the fœtus. Examination *per vaginam* is also unavailing in recognizing the symptoms of pregnancy. The abdominal tumour meanwhile increases. In this case, above all others, it is requisite to leave the decision of the question, as Professor Kilian says, to time, and extremely unsafe to give an opinion. The evidence is hitherto rather negative than positive. At length, as the abdominal swelling enlarges, it becomes, if not manifest, at least highly probable that the enlargement depends on a new growth, either in the ovaries, or in some of the appendages of the uterus, or, it may be, in the peritoneum itself. The tumour is solid, firm, and resisting; but does not present the ovoidal shape, or regularly rounded surface of the uterine tumour. In some instances, the substance of the tumour may turn out to be what is termed malignant, that is, of the encephalomatous character. All tumours of this kind are assembled indiscriminately together by Cullen, under the general denomination of *Physconia*, and by Mason Good under that of *Parabysma*. Both names are totally useless in conveying anything like a distinct or intelligible idea of the nature of the tumour, its relations, or its exact seat, or its contents.

Other similar cases, even, in which, for other reasons, and with different views, the determination of the question as to the presence or absence of pregnancy becomes of the utmost importance, the experience of every one will suggest.

With the view of obviating, and as far as may be, excluding all difficulties and doubts, Professor Kilian urges strongly the aid derived from the use of two instrumental means, viz. auscultation and the employment of the *speculum uteri*.

With regard to the first method, he finds it requisite to defend the practice of mediate against that of immediate auscultation. The great use of the instrument is, that with the educated and practical ear, it enforces more attention to particular sounds, concentrates the attention of the observer upon particular points, and, consequently, is a mean of obtaining more precise results. He thinks, however, that the instrument, in order to be useful to the purposes of accoucheurs and obstetrical pupils, requires an entire reform.

The instrument employed by him is very simple. It consists of two strong, almost biplane discs, from one line to one line and a-half thick, the lower of which is three inches, the upper two inches in diameter, and the narrowing in the middle, where they are less strong, is united by means of a firm solid piece of wood, 6 inches long, and from 3 to 5 lines thick, by a pair of screws. For the manufacture of this stethoscope, there is selected any compact sort of wood, he specifies boxwood; and it is left unpolished. This instrument, from its easy mode of separation with its very convenient construction, answers all demands for the auscultation of the womb,

as also of the chest, and he states that he has observed accurately with it both the thoracic and the uterine sounds. He further maintains, that this instrument possesses a very essential pre-eminence over the usual hollow cylinder, and, therefore, deserves the impartial trial of every expert observer. This is, that it allows the auscultator to observe all sounds, murmurs, &c. exactly, and to recognize them less violently; it precludes all acoustic illusions, which in all other stethoscopes so readily take place, and lead beginners astray; it requires also in its application none of the numerous and indispensable precautions which the instrument of Laennec demands; and lastly, it is, especially on very rigorous application in the gravid and suspected gravid womb, more endurable than the other instruments with the edges of their broad bases always more or less sharp. This stethoscope, he maintains, may be placed with its large discs on the parts to be submitted to auscultation, and held firmly with the ear applied over the other disc with gentler or stronger pressure, yet without the uniting rod being touched by the finger, as by that the conducting of the sound would be impaired.

Though, undoubtedly, auscultation with this apparatus requires practice, yet, with some perseverance and a good ear, the observer advances so speedily in its use, that he recognizes and distinguishes with certainty whatever can be discovered in favourable circumstances. By means of this stethoscope maybe heard,—1. the beat of the heart of the infant; 2. the murmur of the circulation of the pregnant womb; 3. the somewhat sibilant beat of the umbilical chord; 4. the plashing noise of the *liquor annii* caused by the motions of the fœtus; 5. the murmuring noise of wind in the bowels; and also, 6. in rare cases the pulsation of the aorta and iliac arteries of the mother. Among these the points of most particular importance are the circulation-thrill of the gravid womb, and the beat of the heart of the infant, which are, indeed, so essential, that by them the practical use of auscultation in the diagnosis of this state is perfectly demonstrated.

In giving directions for auscultation in the pregnant female, he recommends that the patient should be so placed that the explorer has to make as little corporeal effort as possible, and particularly that he should not stoop too much; and that in the apartment complete tranquillity be observed; while the observer takes means to insure the greatest tranquillity in his own vascular system; without which, he adds, various illusions are apt to ensue.

The beat of the heart of the fœtus varies from 120 to 140 in the minute. In some instances it is much less frequent, being only from 80 to 90, which is chiefly observed in retarded births with late discharge of the *liquor annii*. On the other hand, in some cases, especially where the motions of the infant are numerous and violent, they are found to be accelerated so much as not to be numbered. In about eight cases, in which we have personally observed re-

peatedly with great care, the beat of the heart of the fœtus in pregnant females, we have found it never under 130, and most commonly about 140. It could be easily recognized as a very small but clear beat, in which each sound followed each other most rapidly. Most commonly they are observed in the left side of the uterus. This circumstance is regulated chiefly by the position of the fœtus, but it does not altogether depend on the latter fact; and Professor Kilian states that he has notes of a few cases in which the opposite result was observed.

The beat of the heart of the *fœtus in utero* is observed to be not always of the same strength; it may wax and wane in force; and the Professor admits that he has sometimes found it altogether gone for a longer or a shorter time; and, notwithstanding every endeavour to observe it, he could not; and he found that the same circumstance had occurred to other very expert auscultators, both domestic and foreign.

This observation is one of great moment, and deserves particular attention, both from those who employ this method of diagnosis, and those who doubt its truth. Of the latter we have no doubt, for we have repeatedly verified its general correctness.

With the view of obviating various objections which have been urged against the employment or advantage of auscultation as a diagnostic method in pregnancy, real or suspected, Professor Kilian properly remarks that all our experience on this head shows that to successful auscultation two conditions are requisite. The first is a particularly acute and true or just ear,—an ear, in short, capable of recognizing rather nice differences in sounds, and the difference, if we may so express ourselves, between sound and no sound. The reason of this condition is quite obvious. Some of the sounds produced by the intrinsic motions of the living organs are so delicate and evanescent, that it is not always easy to catch them; and the ear requires to be trained by a peculiar education, in order to render it capable of this faculty. It fares, indeed, no better with the auscultation of the womb than with that of the chest, that in many cases some of the acoustic phenomena are so subtle, that they can only be detected in very auspicious moments; and when one auscultator has heard them, another immediately after may be unable to do so.

The second condition which Professor Kilian regards as requisite to successful auscultation is to have the means of uninterrupted practice in the art. The necessity of this condition is so manifest that we dwell not on it.

The next great instrumental means recommended by Professor Kilian is, examination of the vagina and orifice of the womb by the speculum. To the operation or inspection thus accomplished, the Professor applies the name of *Dioptrismus*, or simply Dioptrism.

For this the patient must be so placed, that the clear day light may pass through the aperture of the speculum to the upper end of the vagina and orifice of the womb, if possible.

The diagnosis of pregnancy and parturition derives little advantage from Dioptrism. We recognize by the *speculum uteri* the walls of the vagina in the pregnant female forming less considerable folds than usual, the rugæ less deeply notched, apparently, or perhaps actually, running in larger lines; we also observe the secretion of a white, sometimes yellow cream-like mucus, usually increased in quantity, and not unfrequently on the upper surface of the vaginal mucus membrane, pointed, prominent, bright-red papillary elevations. The vaginal portion of the uterus, which we oftentimes find in the right half of the pelvis, appears greatly relaxed, turgescient, thick in circumference; the *os uteri*, usually not round, but rather slit-like, sometimes rugous; the lips frequently occupied with the same sort of fleshy warts which are met with in the vagina, and pouring on the vaginal portion thick drops of mucus quite similar to that of the vagina. The most remarkable circumstance in the state of the female organs in pregnancy is the bluish or wine lee-like colour, which the mucous membrane of the vagina and the superficial layer of the vaginal portion in several places shows. This has been formerly noticed both in the account of M. Parent Du Chatelet's work and in that of Dr Montgomery.

These form the principal topics treated in this introduction. We have only to say, that the translation by Dr Schwann is executed with great accuracy and fidelity, and gives a correct version of the views of the author. The index, which is ample and minute, is a very valuable addition to the work, and must, in facilitating consultation and reference, render the information greatly more accessible to the German than to the English reader.

We have only to add, that, when another edition of Dr Montgomery's work is required, which it is likely to be at no remote period, the author would enhance the value of his work by prefixing a translation of Dr Kilian's introductory remarks, and annexing a translation of the excellent index, with which the present edition is furnished.

PART III.

MEDICAL INTELLIGENCE.

ANATOMY AND PHYSIOLOGY, AND ANIMAL CHEMISTRY.

On the formation of the Blood-Corpuscles. By M. REMAK. (*L'Experience*, 24th November 1842.)—M. Remak found in the blood of the chick *in ovo*, the third week of incubation, blood-corpuscles, some rounded, others pyriform, others of the form of a biscuit with inflated edges and a central nucleus. Appearances were sometimes seen resembling two nuclei united by means of a slender prolongation, which led to the belief that blood-globules were produced by division of the existing ones. The blood-corpuscles of a foetal pig an inch long were from four to six times larger than those of the adult animal, and had from two to four nuclei separated by pale lines. In order to observe the actual formation of blood globules, 30 pounds of blood were drawn from a horse. The first blood drawn exhibited simply blood-corpuscles without nuclei, and a small number of lymphatic corpuscles. The next day these were very abundant, and the most of them enlarged in size. In their interior were seen one or more globules of a pale-red colour, the size of the blood-corpuscles, and surrounded with granules. During the following days the redness of these corpuscles increased in proportion as the granular matter which filled the mother cell, or enlarged lymph corpuscle, disappeared. On the fourth day after the bleeding, it was evident that the red blood-corpuscles formed within the interior of these large pale-coloured cells, and became free by the mother-cell disappearing. The blood of the horse became more coagulable, and the thickness of the fibrous buffy layer greater as more blood was drawn, and this buffy coat was composed of a small quantity of fibrine and a large quantity of these pale mother-cells. The buffy coat which is seen on the surface of the blood after one or two bleedings, M. Remak considers not to be similar to the inflammatory coat, and, of course, not a sign of inflammation, being composed, as he says, chiefly of mother-cells. The mother-cells he regards as not formed in the blood itself, but in the cellules which line the interior of the blood-vessels and lymphatics.

On the Composition of the Blood of some of the Domestic Animals. By MM. ANDRAL, GAVARRET and DELAFOND. (*Annales des Sciences Naturelles*, October 1842.) These experimentalists found the average proportion of fibrin in man to be three in the thousand parts of blood; but this proportion varies greatly in the lower animals. Of the animals experimented on, the pig furnished the largest proportion of fibrin. In it the average was so high as 4.6, the maximum being 5, and the minimum 4.1. In horses, the animals with the next largest proportion of fibrin, the average proportion was 4. Saddle horses yielded a rather larger proportion than post horses, being on an average in the first 4.5, in the last 3.9. In horses

the maximum of fibrin was 5, the minimum 3. In oxen the average proportion was 3.7, the maximum being 4.4, and the minimum 3. In a bull the proportion was 4.2, and in an other labouring under inflammation of the foot 5.5, an increase attributed to the inflammatory action.

In the merino sheep the average was, for the rams, 3.1, for the ewes 3, the maximum obtained being 3.8, and the minimum 2.2. The English race of sheep (Leicesters,) furnished a smaller proportion of fibrin, amounting only to 2.6. The average proportion of fibrin of the blood of the rams of the same race was higher, giving an average of 3. Goats gave an average of 3.

In dogs the proportion of fibrin was unusually small, averaging only 2.1, the maximum being 3.5, and the minimum 1.6. Of these dogs, those fed chiefly on flesh furnished the least amount of fibrin.

Man, in the proportion of fibrin in his blood, seems thus to hold a medium place between those in whom the fibrin predominates and those in whom it is deficient.

When the proportion of blood globules is examined in the different animals, they are seen not to hold any particular connexion in their proportions with that of the fibrin. The dog, in whom the proportion of fibrin is least, gives the larger proportion of blood-globules, being on an average 148.3, furnishing a maximum of 176.6 and a minimum of 127.3. Pigs gave an average of 105.7, the maximum being 120.6, the minimum 92.1. Saddle horses an average of 104.5, the maximum being 112.1, and the minimum 91.3. Post horses an average of 101.1, the maximum being 111.3, the minimum 81.5. Goats an average of 101.1 the maximum being 105.7, the minimum 92. Merino sheep, an average of 101.1, the maximum being 123.4, the minimum 82.7. English sheep, an average of 95.0, the maximum being 110.4, the minimum 83.3. Milk cows, an average of 101.9; the maximum being 117.1, and the minimum 90.5. Oxen, an average of 97.4; the maximum being 112.1, the minimum 85.1. An English bull, 132.3, of red blood globules. A Swiss bull, 117.0, and another bull, 81.7.

In all these experiments, it was satisfactorily ascertained, that the proportion of fibrine and of blood globules had no dependence on each other, and it was not the same cause which produced an augmentation or diminution of these two ingredients of the blood. From the examination of the blood of some new-born lambs, it was found that though the proportion of blood globules was greater than in the adult sheep, the fibrine was at a minimum of 1.9, but this last gradually increased till in 48 hours after birth it arrived at the average 3.0, which occurs in the adult. In lambs, the average of fibrine was less than in the sheep, but the amount of blood globules a little greater.

To ascertain the effect of pathological conditions on the body, some sheep were bled previous to delivery, and again after lambing, when it was found that the proportion of both blood-globules and of fibrine was diminished previous to lambing, but much increased after it, during the time they were suffering from milk fever. Cows presented the very same phenomena; and it is interesting to know that the proportion of solid matter in the serum underwent a marked diminution when the proportion of fibrine and of blood-globules increased.

The proportion of solid matter in the serum varies in the different species of animals. In dogs it was 75.5; in pigs, horses, oxen, and merino sheep, from 80.1 to 86.3. In English sheep, 92.4.

It is thus seen that all the elements of the blood maintain a complete independence. They neither increase nor diminish all together. Thus the dog, whose blood is richest in globules, is poorest in both fibrine and albumen, and, on the other hand, the blood of the English sheep, though poorer in globules than the merino sheep, is richer in albumen.

The authors deduce many interesting conclusions from the facts above stated, as well as from some which they have not fully detailed. Among them it is stated,

That the blood globules are most numerous in the carnivorous animals. That the greater their proportion the greater is the energy of the constitution. That the proportion of the globules is not sensibly augmented during fevers. That in cachectic diseases, their proportion is always diminished. That the proportion of albumen also diminishes during cachectic states. That dropsy does not come on as a consequence of the altered state of the blood, unless the blood has its quantity of albumen diminished. That the globules may be very deficient, as in chlorosis, and yet not give rise to dropsy, but that disease immediately appears if the albumen be diminished, as in albuminuria, or when hydatids exist in the liver of the sheep.

Origin of Fibre—Structure of Fibrine and of False Membranes. (From Mr GULLIVER'S *Contributions to Minute Anatomy, London and Edin. Phil. Mag.* for October 1842.)—It has been commonly supposed that fibrine only presents an organized appearance when its coagulation has taken place in contact with the living tissues. In his Notes and Appendix to Gerber's Anatomy, Mr Gulliver has described and depicted a most distinct structure in fibrine which has coagulated after death, or after the removal of the blood from the body; and a similar character was shown in a false membrane. He now gives several more figures to show the analogy of structure in false membranes and fibrine coagulated as above-mentioned. This structure is made up of fibrils of extreme delicacy and tenuity, and of corpuscles possessing the characters of primary cells or organic germs.

Of late years the origin of fibre, as well as of all other tissues, has been ascribed to the growth of cells; but these observations render it probable that the mere extension of the parietes of cells is not essential to the formation of all textures, since fine fibres or fibrils are found in fibrine which has clotted even out of the body.

"Mr Gerber (Gen. Anat. figs. 16-18,) has delineated what he terms the first, second, and complete stages of *fibrillation* in the progress of organization in the fibrine composing coagulable lymph; but he does not say how much his drawings are magnified, though in some of them a very low power must have been employed. Others are sufficiently enlarged to show the cells, from which he says the fibres are formed, and this is precisely the point in which my observations are at issue with the views now generally entertained concerning the origin of fibres.

"All the organic tissues, says Dr Schwann, however different they may be, have one common principle of developement as their basis, viz. the formation of cells; that is to say, nature never unites molecules immediately into a fibre, a tube, and so forth; but she always in the first instance forms a round cell, or changes when it is requisite, the cells into the various primary tissues as they present themselves in the adult state.

"How is the origin of the fibrils which I have depicted in so many varieties of fibrine to be reconciled with this doctrine? and what is the proof that these fibrils may not be the primordial fibres of animal textures? I could never see any satisfactory evidence that the fibrils of fibrine are changed cells; and, indeed, in many cases, the fibrils are formed so quickly after coagulation, that their production, according to the views of the eminent physiologist just quoted, would hardly seem possible. Nor have I been able to see that these fibrils arise from the interior of the blood discs like certain fibres delineated in the last interesting researches of Dr Barry."

As formerly observed by Mr Gulliver, (App. to Gerber's Anat. p. 17.) Dr Macartney's view of the healing process is supported by the observations on fibrine. Now it is known that a clot of this substance, which has

coagulated quite independently of inflammation, is a curious and complicated structure, in other words, really organized, even as much so as false membranes are at first, it may be readily granted that inflammation is rather hurtful than salutary in the reparation of injuries, and, indeed, altogether unnecessary to the cure of wounds, contrary to the opinion so long entertained by the school of Hunter.

On Artificial Chymification. By M. STANNIUS. (*L'Experience*, 24th November 1842.)—M. Stannius's experiments were made with the mucous membrane of the stomach of the cold-blooded animals. He carefully removes the mucous membrane of the stomach of the frog, adds water to it, then beats it in a mortar, and filters the fluid. An extremely small quantity of hydrochloric acid is added to this fluid, which is then found to possess the property of dissolving fibrine, albumen, &c. If no acid be added, the liquid decays rapidly, and possesses no solvent powers, but it keeps for some time, and has strong solvent powers if it be very slightly acidulated with hydrochloric acid.

Notice of a Man with three Testicles. By F. MACANN, M. D. Staff Surgeon, Recruiting Depot, Coventry, October 15, 1842.—The subject of the present notice, William Howard, an Englishman by birth, and aged about twenty years, was brought before me at this station on the 28th ultimo (September,) as a recruit for the 35th Regiment of foot.

On looking at him in a state of nudity, as is usual on such occasions, my attention was at once attracted by the appearance of the scrotum, which seemed fuller and larger on the right side than on the left. A minute examination of the part was in consequence made, and the following facts, carefully ascertained, were noted down upon the spot.

The scrotum was not at all pendulous, but drawn up and corrugated as in a healthy man, so that the difference in size and form between the two sides was very striking.

On applying the hand to the part one testicle was found in its proper place on the left side of the raphè. In size, and form, and feeling also, this testicle was perfectly natural, and may be considered, therefore, as a standard wherewith to compare the others.

On the right side of the raphè, and on the same level as the former, another testicle was found, in all respects perfectly natural, and similar to that on the left side; and of which, therefore, it may be considered as the proper counterpart.

So far all was perfectly regular; but on this side of the scrotum also, (the right) another body was now felt, so similar to the other two just noticed, in size, in form, in feeling, and in consistence, as to leave no doubt of its being a third testicle.

This body was situated within the scrotum—between the groin and the proper testicle of this side; with which, however, it did not seem to be in immediate contact, but to be suspended, as it were, by a shorter cord, or hung up in a separate sac; in fact, it seemed as if it had dropped from the abdomen after the other, but had not been permitted to fall so low in the scrotum as to touch it. In consequence of this arrangement, the lower testicle was not at all pressed upon by the upper.

On the left side the spermatic cord was perfectly natural in all respects, and was easily traced from the groin to the testicle to which it belonged.

On the right side, however, the cord was much thicker than natural at its upper part, where, in fact, it consisted of two cords, one of which was distinctly traced into the upper testicle on this side, and the other, much longer, into the lower testicle. And it is to be particularly noted that in each of those parts, as well as in the cord on the left side, the hard sper-

matic vessel, (*vas deferens*) could be distinctly felt, like a piece of whipcord between the fingers. The three testicles, therefore, were, to all appearance, perfect and similar to each other.

The penis was well formed, and all the parts were fully developed, extremely dark, and well furnished with black hair; in fact, there was about the man every indication of vigour and efficiency, so far as the parts of generation were concerned, and in all other respects he presented the appearance of a strong, active, well-made man; his height was 69 inches, and the circumference of his chest 35. He was himself perfectly aware of the existence of the third testicle, which had occupied, he said, its present situation as long as he could remember, and had never caused him any inconvenience. I may add there was no laxity of the inguinal ring on either side, nor any other appearance of local disease.

Anxious to verify the actual state of this man in the most satisfactory manner, I had him brought before me again on the following day, and again examined him minutely in the presence and with the assistance of Dr Colclough, Assistant Surgeon 3d Dragoon Guards, now in garrison here. At this examination every particular of the foregoing detail was investigated anew and fully confirmed, and the conviction was, thus I may say, forced upon our minds that we had before us the singular spectacle of a man with three testicles.*

Similar cases to the preceding have, I am aware, been seen and recorded by other persons, but having no books here to refer to, I cannot venture to make any remark on their peculiarities, or on the comparative rarity of such occurrences; with respect to my own experience, however, I may say that I have, in the course of my life, professionally examined many thousands of men, and never met with a similar example.

It only remains for me to add, that the man was rejected as a soldier, in consequence of bearing upon his person marks of leeches and cupping; which, together with his general appearance, led to the suspicion that he was a deserter from the service; this, however, he denied, and in the absence of more direct proof he could not be detained.

On the Pus-like Globules of the Blood. (From Mr GULLIVER'S Contributions to Minute Anatomy, Lond. and Edin. Phil. Mag. for September 1842.)—The pus-like globules found in the blood of patients affected with severe inflammatory and suppurative diseases are very like the pale globules of healthy blood; but there are some points of difference which the author now describes with the aid of engravings.

In inflammatory affections the pus-like globules of the blood are generally rather larger, more irregular in size and form, and often more opaque than the pale globules in the blood of healthy animals. In disease the pus-like globules are frequently clustered together, and commonly much more numerous than in health. When the pus-like globules of the blood of patients labouring under inflammatory or suppurative diseases are treated with dilute acetic acid, the molecules composing the nucleus are seen to be surrounded, and often widely separated, by a quantity of very minutely granular matter, which is either less obvious or even absent in the pale globules of healthy blood which have been subjected to the action of the same acid.

The globules occurring in disease are sometimes still more peculiar. These, in the venous blood taken from a fatal case of inflammation and suppuration, were composed of one or more red corpuscles, apparently blood discs, included in a delicate and pale envelope.

In a case of great swelling with purulent deposits in the leg of a mare,

* Adverting to the symmetrical arrangement of the body, I think it very probable that in this, and other similar cases, a fourth testicle may exist within the abdomen.

the pus-like globules of the blood presented an average diameter of $\frac{1}{2500}$ th of an inch, and were nearly half as numerous as the red discs; while in the blood of a healthy mare, examined at the same time for comparison, the pale globules were by no means so plentiful, and they generally measured from $\frac{1}{3500}$ th to $\frac{1}{2500}$ th of an inch.

On the composition of Fibrine, Gluten, Albumen, and Caseum. By M. BOUCHARDAT. (*Comptes Rendus des Seances de l'Academie des Sciences*, 20th June 1842.)—MM. Duinas and Cabours ascertained that animal and vegetable albumen and casein possessed the same ultimate composition; that fibrine possessed a larger amount of azote and less carbon than caseum or albumen, and that pease, almonds, haricot beans, &c. contained a substance still richer in azote than even fibrine itself, but with a smaller proportion of carbon. M. Bouchardat found that fibrine, whether extracted from the blood by stirring it with a stick, or procured from the inflammatory buffy coat, contains a large proportion of gelatin, a principle analogous to albumen, which he terms albuminose, and a third element, which, in its characters, resembles epidermis, and which he terms epidermose. As gelatine is more highly azotized than fibrine, this fact shows how the presence of these substances in fibrine must cause its composition to vary.

These elements are easily extracted from each other. The buffy coat of blood is carefully removed, and is allowed to macerate for 24 hours in water which is frequently renewed. An opaque, resistant white membrane is thus obtained, which, by means of gentle ebullition with three times its weight of water, and then boiled down to one-half, yields a solution which gelatinizes on cooling, and possesses all the properties of gelatine. The portion of membrane which is left undissolved is immersed in water acidulated with a 5000th part of hydrochloric acid, when it swells, and on being boiled dissolves. The solution furnishes all the characters of albumen. A very small portion of membrane still escapes solution in the hydrochloric acid; this is what the author names epidermose. When gluten, caseum, and albumen were treated in the same manner similar solutions of albuminose were obtained. M. Bouchardat, therefore, infers the identity in ultimate composition of these substances, in appearance so different, from their physical and physiological properties being analogous.

Researches on Digestion. By MM. BOUCHARDAT and SANDRAS. (*Annales des Sciences Naturelles*, October 1842.)—By feeding dogs with pure fibre, killing them at different intervals after taking the food, and examining carefully the contents of the stomach, intestines, and the chyle itself, and comparing them with the appearances presented in dogs killed while fasting, MM. Bouchardat and Sandras have arrived at results which, while opposed to the usual belief of the physiology of digestion, seem to bear out the conclusions drawn by the illustrious experimentalists. They found that the fibrine was converted into a fluid in the stomach, was in fact dissolved. They found that the fluid did not pass into the intestines, or but a very small portion only, that all the truly dissolved matters were removed like other fluids from the stomach itself. That the matters which were found in the intestines of the animal killed when fasting were identically the same as those of the animal fed with a full meal of pure fibrine, only the latter contained a slightly greater proportion of fibrine in a dissolved or fluid state. The chyle, too, of the fasting animal presented the exact same qualities as that of the animal which had a full meal of fibrine, the proportion of dissolved fibrine in it was only very slightly greater.

It was found that the solution of the fibrine in the stomach took place by means of hydrochloric acid, and that the same process could be imitated out of the body by mixing a quantity of hydrochloric acid, so small as scarce-

ly to affect litmus paper, in distilled water, and immersing in it a morsel of fibrine. After 12 hours, at the ordinary temperature, the fibrine was found converted into a gelatinous mass, which, if dissolved in distilled water and filtered, could not be recognized to differ in any chemical character from the fibrine found dissolved in the stomach of the dog. These experimentalists, therefore, regard the hydrochloric acid as the essential agent in the solution of the fibrine; and as the experiments of Hallé, Magendie, and other physiologists prove, that alcohol and other fluids, coloured and uncoloured, are removed directly from the stomach by means of the venous system, and cannot be recognized in the chyle, while their presence can be detected in the blood, MM. Bouchardat and Sandras have no hesitation in stating, as the result of their observation, that the same takes place with the fibrine after it has once become dissolved.

They performed analogous experiments on dogs with gluten, and found the very same results were arrived at. It formed a solution in the stomach precisely similar to that of fibrine; was removed from the stomach in the same manner, without passing into the intestines in any appreciable quantity; and dissolved out of the body by means of water slightly acidulated with hydrochloric acid. Albumen and pure caseum underwent solution in diluted hydrochloric acid in the same manner, and furnished the very same reactions with chemical agents.

A number of other experiments were made on the digestion of starch, sugar, &c. from which it appeared that these substances all became converted in the stomach into lactic acid, and were removed from it directly in the same manner as the dissolved fibrin, gluten, &c. had been. The chyle of animals fed with these non-azotized matters yielded no traces of starch and scarcely any of acid. In all animals the chyle was alkaline, or quite neutral. When dogs were fed on substances which they loathed, and would have vomited were the œsophagus not tied, the chyle was neutral, but when fed on bread or potatoes was always alkaline.

Experiments were also made on feeding dogs with fat. It was found that this substance was not altered in properties in the stomach, as pure fat was obtained from the pulaceous mass. The other liquids present in the stomach were acid, and contained hydrochloric acid. In the duodenum a yellowish-coloured emulsive mixture was found, with a neutral reaction, which yielded fat when washed with ether. The other small intestines contained also a similar matter, which furnished fat to ether. The thoracic duct furnished a white milky-looking chyle, much whiter than was ever seen in the former experiments, and when washed in ether furnished a notable quantity of fat.

These experiments seemed to prove that fat is digested in a very different way from the other nutritive matters; that it undergoes no change in the stomach, but that its chief changes occur in the duodenum; that, in fact, those changes occurred to it there which facilitated its absorption. These changes are, however, very simple. The pancreatic fluid and the bile mixing with the fatty matters, form a simple emulsion, without changing the chemical nature of the fatty matters. If these contain margaric and oleic acids in their natural state, they are saturated by the alkali contained in the pancreatic juice and in the bile. In this state they are absorbed by the orifices of the chyliferous vessels, and from thence carried into the thoracic duct, and mixed with the chyle. The analysis of the chyle proves this fact, and the examination of the contents of the bowels, at all parts of their course, prove that they contain fatty matters, which, if given in too large quantity, are even excreted with the feculent matters.

MM. Bouchardat and Sandras draw the following important conclusions from their experiments:

1. In digestion, the functions of the stomach consist in dissolving with

the aid of hydrochloric acid, all albuminous matters, as fibrine, albumen, caseum, and gluten.

2. This acid, if diluted with 5000 parts of water, dissolves the same matters out of the body, provided they are not cooked; but if boiled the solution has no action on them. As they are found to be dissolved, however, in the stomach, it is probable that some other agent is at work than simple solution by means of hydrochloric acid: but the presence of that acid seems to be always indispensable.

3. As far as the albuminous matters are concerned, digestion and absorption take place exclusively in the stomach; the intestines present scarcely any traces of those dissolved matters which exist in such abundance in the stomach.

4. Solution of fecula also occurs in the stomach. This principle does not appear to pass into the state of sugar, and the experiments do not even warrant the statement that it passes into that of soluble starch; we regard as proved, its transformation into lactic acid.

5. The absorption of this kind of aliment seems to take place less exclusively from the stomach than that of the albuminous matters, a circumstance which would accord with the particular disposition and length of the intestines in animals not carnivorous.

6. Fatty matters are not attacked in the stomach. They pass into the duodenum in a state of emulsion, in consequence of the alkalies furnished by the liver and pancreas. This emulsion is found abundantly throughout the whole course of the intestines.

7. The chyle has appeared to be somewhat less abundant, but presenting similar characters in the animals which were killed after long fasting, and in those killed after being fed on copious meals of albuminous matters and of fecula. It has only presented a marked difference in those fed with fat, when this principle was met within it in considerable proportion.

Differing as these views do from those at present in vogue relative to digestion, M.M. Bouchardat and Sandras add a few remarks on the peculiarity of their views and the probable use of the chyloferous system of vessels. It is to be remembered that they found that the chyle procured during the digestion of fibrine did not differ in a single character from that procured from an animal fed on fecula alone, or in a state of starvation. That, in fact, these matters had not been converted into chyle. One important fact they ascertained to be was, that these chyloferous vessels absorbed the fatty matter, but this cannot be their sole use. During digestion a large quantity of hydrochloric and lactic acids are secreted and thrown into the stomach. These acids must come from the decomposition of salts existing in the system—chloride of sodium and lactate of soda. The abdominal glands prepare for the chyloferous vessels and thoracic canal, a chyle, the alkalinity of which is greater in proportion to the acidity developed in the stomach; and thus chyle, which is not solely produced by the absorption of aliments, but by a process of true secretion, mixes with the blood, to neutralize the acid which was indispensable for the solution of the food in the stomach. This simple process allows the blood to be continually repaired, without appreciably changing its nature.

Case of third Dentition. By M. SORGONI. (*Il Raccoglitore Medico*, May 1842.)—One of the daughters of the Countess Z— began to lose her milk set of teeth when six years of age, and completed her permanent set in her twelfth year. A little more than a year ago the permanent incisor teeth became loose and dropped out, but were replaced by others. The whole of the other teeth during the course of the year dropped out, and were replaced in a similar manner by a third set of teeth.

On Menstruation. By M. BRIERRE de BOISMONT, 8vo. Paris 1842' In his work "de la Menstruation considérée dans ses Rapports Physiologiques et Pathologiques," M. Brierre de Boismont, among a mass of interesting facts, gives the following curious table of the ages at which menstruation commences. It is the most extensive table yet published, including the results of 2362 cases.

Age.	Paris, 1200 cases by Meniers.	Paris, 85 cases by Marc D'Espine.	Lyons, 432 cases by Petrequin.	Marseilles, 69 cases by Marc D'Espine.	Manchester, 450 cases by Roberton.	Gottingen, 137 cases by Oslander.
5	1	0	0	0	0	0
7	1	0	0	0	0	0
8	2	0	0	0	0	0
9	10	1	0	0	0	0
10	29	0	5	0	0	0
11	93	3	14	6	10	0
12	105	14	26	10	19	3
13	132	6	47	13	53	8
14	194	18	50	9	85	21
15	190	14	70	16	97	32
16	141	7	79	8	76	24
17	127	6	58	4	57	11
18	90	5	38	2	26	18
19	35	8	21	0	23	10
20	30	3	9	0	4	8
21	8	0	5	0	0	1
22	8	0	1	0	0	0
23	4	0	0	0	0	1
24	0	0	3	0	0	0

This table demonstrates that by far the greatest number of women begin to menstruate during their 14th and 15th year, and that the proportion diminishes both above and under that age.

As to the occurrence of *fluor albus*, it is mentioned that, in a fourth of the cases, this discharge preceded the appearance of the menses. In the greater proportion of the cases in which the *fluor albus* occurred, the women were fair, with blond hair, and lymphatic constitutions, and were born in towns. After the establishment of the menses the author has seen leucorrhoea make its appearance in 248 out of 263 cases.

Relation of the Fallopian Tubes to the Ovary in the Mammalia. By M. RACIBORSKI. (*Comptes Rendus des Seances de l'Academie des Sciences*, 20th June 1842.)—M. Raciborski has ascertained that in the mammalia the extremities of the Fallopian tubes are so disposed during the act of fecundation as to envelope the entire ovary, either directly by means of their open trumpet-shaped extremity, or mediately with the aid of their fimbriated extremities. In woman, on the other hand, the trumpet-shaped extremity of the Fallopian tube envelopes but a small proportion of the ovary. The author is therefore of opinion that it is this anatomical peculiarity, rather than mental emotions, which is the probable cause of extra-uterine conceptions being so much more common in women, and so rare in the inferior animals.

MEDICAL PATHOLOGY AND THERAPEUTICS.

Epidemic Scarlatina Anginosa in the Canton of Lion-d'Angers during the year 1841. By Professor GUERETIN. (*Archives Generales de Medecine*, July 1842.)—That form of scarlatina characterized by the severity of the affection of the throat, and the almost complete absence of all exanthematous eruption, broke out in the Canton of Lion-d'Angers about the beginning of June 1841, and attacked a very large number of the children. The disease presented itself under three forms,—mild, inflammatory, and malignant, yet in all presenting the peculiar characters of the disease.

In the mild form the angina was always the first symptom of the disease which appeared. Deglutition was difficult and painful, and the tonsils and fauces presented a fiery-red appearance. Neither tonsils nor glands of the neck were in general swollen; neither did there appear any scarlatinous eruption on the skin, or if it did in a few cases, it was not well characterized and fugacious. Very little fever was present, and the simplest remedies served to remove the complaint.

In the inflammatory form, the angina was also the first symptom of the disease which appeared. The submaxillary and cervical glands as well as the fauces and tonsils became swollen, the latter apparently in consequence of submucous infiltration, and presented a bright-red colour, which often extended to the tongue and buccal membrane. In many cases the swelling of the tonsils and arch of the palate was so great as nearly to close the aperture of the throat. In at least the half of those attacked, the tonsils, and sometimes the other inflamed parts became covered with pseudo-membranous exudations, which had but little adherence to the subjacent surface. The skin was commonly dry and of a burning heat, but in only about one-half of the cases did anything like a scarlatinous eruption make its appearance. In these cases, however, its appearance varied. In some it assumed the characters of true scarlatina, and went through all the stages of that disease; in others it resembled a papular or miliary eruption, or even urticaria itself, both in its appearance and in its fugacious character. These eruptions frequently appeared and as rapidly disappeared during the course of the disease.

All the cases of this form terminated successfully. The remedies employed were general and local blood-letting, warm baths, sudorifics, but especially active purging by means of calomel and jalap. This last was especially successful in curing the diarrhœa and vomiting, which often attended the invasion of the disease, and moderated all the symptoms. At first the inflamed parts were touched with the nitrate of silver and hydrochloric acid, but when he acquired greater experience in the treatment of the disease, M. Gueretin gave over using any local treatment, and found his patients recover as speedily without it.

In the malignant form, two subsidiary varieties occurred, one more chronic, the other acute. In the chronic form little or no pain was complained of, but the throat and neck were much swollen, the tonsils and fauces covered with a yellowish-white consistent false membrane, which required considerable traction for its removal, and the parts below had an excoriated bloody appearance. General uneasiness and slight feverish symptoms with occasional rigors often existed for a week. The face was pale and swollen, the breath fetid, the respiration normal or slightly embarrassed, in consequence of the extension of the inflammation to the nasal fossæ and to the larynx and trachea. Mucopurulent matter was discharged from the nostril of a very fetid odour. Prostration of strength appeared from the first appearance of the disease. About the fifth day of the disease cutaneous eruptions generally appeared in the form of little red lenticular points, multiplied to infinity, accompanied by miliary vesicles. These spots were occasionally very dark or livid, did not disappear under pressure,

but resembled a fine form of purpura (petechiæ?) In some cases large patches of a livid but true scarlatinous eruption were present, and in a few no eruption whatever could be detected. If blisters were applied, they became covered with thick gangrenous incrustations. The face, body, and belly became much swollen and leucophlegmatic, the stools fetid and at length bloody, and convulsions carried off the patient in from eight to fourteen days after the seizure.

In the acute malignant form, the disease came on suddenly with violent fever and angina, with complete prostration of the strength in twenty-four or thirty-six hours, violent rigors, delirium, constant vomiting, and diarrhoea, skin burning in some regions, quite cold in others. The pharynx and fauces were of a deep-purple colour, and soon became covered with a false membrane. A true scarlatinous eruption appeared within the first twenty-four or forty-eight hours, and rapidly changed to a deep-purple or violet colour, or was succeeded by a deep icteric tint, mixed with the deep scarlet eruption. Death usually occurred from the third to the ninth day. The only treatment found to be of any use in these two forms of the malignant disease were purgatives of calomel and jalap, and gargles of alum, or simply alum powder blown into the throat and nose.

Of 99 cases of *scarlatina angina*, treated by Professor Guérétin, eight fell victims to the disease. The fatal cases all occurred among those affected with the malignant form of the disease. Thus 6 were attacked with the chronic malignant form; of these, 4 died; 8 laboured under the acute malignant form, and of these 4 died. No account is given of the morbid appearances.

Hemiplegia from tying the Common Carotid Artery. By Professor SEDILLOT. (*Gazette Médicale de Paris*, 3d September 1842.)—A man was wounded, on the night of the 11th April, behind the right branch of the lower jaw. A large arterial jet of blood instantly flowed, which was in vain attempted to be staunched by means of compresses. Dr Francis cut down on the wounded artery and applied a ligature to the vessel, which arrested the hemorrhage for three days. After this it returned with double intensity, and even the tourniquet failed to arrest it completely. On the 23d of April, Professor Sedillot was called to see him, and resolved to cut down on the common trunk of the carotid artery, and throw a ligature around it, as an aneurismal tumour had formed at the site of the wound, and the parts over which the tourniquet had been applied were in a gangrenous state. A ligature was with difficulty thrown around the vessel, the diffuse phlegmonous inflammation having confused the aspect of the parts. This ligature arrested the hemorrhage, and the pulsation of the tumour disappeared. When the operation was performed the patient was in a state of extreme prostration, so that the other consequences of the ligature other than what is stated were not then observed. But when visited three hours afterwards, it was found that complete hemiplegia of the left side of the body and the right side of the face had taken place, and the intelligence of the patient was so far destroyed that he scarcely comprehended questions addressed to him. He died on the 2d of May.

The vessels were injected previous to opening the body, and when the scull-cap was removed and the brain examined, to ascertain, if possible, the cause of the hemiplegia, it was found that the arteries distributed to the right middle, and anterior lobes of the brain were much less injected than those of the left side. These same lobes were also appreciably softer in consistence than those on the left side, but had apparently undergone no other change. No serous fluid was found in the ventricles, none on the surface of the brain. The hemiplegic symptoms, then, had apparently resulted from that side of the brain having been deprived of its due propor-

tion of arterial blood. As the chief interest of this case depends on the hemiplegic symptom and the probable cause, it is unnecessary to detail the other morbid appearances.

On Spontaneous Perforation of the Stomach. By M. LEFEVRE. (*Archives Generales de Medecine*, August and September 1842.)—In an able article on perforation of the stomach, with numerous cases, M. Lefevre states that the solution of continuity most commonly takes place after the stomach has been filled to repletion; that it generally occurs in those who have laboured under stomach affections, though slight, such as indigestion, acidity of the stomach, cardialgia, &c.; that in them, after repletion, or while the stomach is distended with gaseous matters, often the slightest exertion will produce the rupture of the organ. That the disease is most common in women; a circumstance which he finds it difficult to account for, unless it be attributed, as Scemmering supposed, to the alteration in the form of the stomach produced by tight lacing and the wearing of stays.

Death from the introduction of needles into the Heart. (*Archives Generales de Medecine*, July 1842.)—A soldier was brought to the Hospital of Lublin, St Petersburg, screaming with agony from pain, which he attributed to having introduced two needles into the chest in the region of the heart two days previously. His pulse was hard and quick, his countenance anxious, and bathed, as well as his body, in a copious perspiration. Frequent distressing cough, and acute pain in the precordial region were his most distressing symptoms. Slight crepitous rattle was heard at the anterior and lower region of the left lung, but at other places the respiratory murmur appeared to be natural. The action of the heart was tumultuous, but without particular character. Not a trace of the entrance of the needles existed on the skin of the chest. Copious bleedings with other antiphlogistic measures were followed, without affording almost any relief. Hiccup and loss of speech came on the fifteenth day, but he retained his faculties to the last, and died on the nineteenth day.

When the skin was removed from the surface of the chest, two narrow apertures were seen between the fourth and fifth ribs, which penetrated to the cavity of the chest. On laying open that cavity, these apertures were seen to communicate with an abscess which extended into the substance of the lung. The pericardium was very much thickened, and filled with a semi-coagulated whitish or puriform matter, similar to the plastic matter thrown out on serous membranes. This matter formed a layer of about two lines in thickness on the internal surface of the pericardium and surface of the heart. The heart adhered so intimately by its basic and posterior portion to the pericardium, that it required considerable force to remove it. The pericardium equally adhered by new fibrinous adhesions to the left lung and to the diaphragm. The heart was thickened in its substance, and harder than usual. The inferior margin of the left lung was highly inflamed. The needles were found in the posterior and inferior part of the left lung, having, probably made their way to that portion in consequence of the continued movements of the heart and lungs.

Conversion of Nerves into Fat. (*London Medical Gazette*, August 26, 1842). In dissecting the body of a male subject at the Anatomical School of Marburg, some of the nerves of the left leg and foot were found converted into a fatty matter. The whole body was dropsical, the left leg, from the foot to the knee-joint, firmly swollen, and the dorsum of the foot covered with ulcers. The whole of the lower part of the limb was infiltrated with lymph, which, in the neighbourhood of the ankle-joint, had a fatty appearance. As the nerves approached this portion, they became

thickened, and appeared as if composed of mere fat. When examined by the microscope, it was found that an extraordinary quantity of fat was deposited within the nervous sheath, and between the fibres of the nerve, which increased in quantity as it was traced downwards to the diseased structures, till it constituted the whole structure of the nerve. Where the nerve was not so altered, the fat globules appeared to be arranged concentrically on the inner surface of the sheath, and by a strong magnifying power the primitive nervous fibres could be seen running in the centre of the fatty deposit. They gradually disappeared, however, lower down, till at length no trace of them could be found, the fat globules having entirely taken the place of the primitive nervous fibres.

Comparative Pathology of Phthisis Pulmonalis. By M. RAYER. (*Comptes Rendus des Seances de l'Academie Royal des Sciences*, 18th July 1842.)—In a paper on the occurrence of *phthisis pulmonalis* in man and animals, M. Rayer, from the facts which he states, arrives at the following conclusions :

1. Tubercular phthisis is, of all the chronic maladies, the most prevalent in man and animals.

2. In man and the mammalia tuberculous matter can be easily distinguished from recent purulent matter, which is always full of granular globules. In birds the characters of the tubercular matter are less marked; foreign bodies introduced artificially into the lungs and flesh do not give rise to the formation of a white opaque humour with granular globules, but to a dry yellowish matter without globules, the physical characters of which resemble that of tubercles in the mammalia. In reptiles, fishes, and insects the characters of tubercular matter are still less distinct.

3. Purulent matter in the mammalia, but especially in the horse, undergoes successive transformations after it has remained long in the organs of the body, in consequence of which it sometimes assumes the characters of tubercular matter.

4. Pulmonary tubercles in man and the quadrumana have usually a grey tint. In the pommelière of the cow the tubercular matter has usually a chamois yellow colour.

5. In man and the lower animals, the central softening of the tubercles cannot be attributed to the inflammation. Pus globules are never present. The peripheral softening of tubercle is, on the other hand, most usually produced by the inflammation of the contiguous tissues, and is almost always mixed with pus globules.

6. The yellow matter found in the hydatid cysts of the ruminantia, after the disappearance or spontaneous rupture of these hydatids, bears some analogy to the matter of the pommelière; but the cysts filled with this yellow matter almost always contain the debris of the hydatid, and a certain quantity of purulent matter.

7. The cretaceous or calcareous concretions, chiefly composed of the carbonate and phosphate of lime, met with in the lungs of man and animals, ought not to be considered, as has always been done, as the last modification of tubercle; they are often in man, and very often in horses, the remains of a small deposit of purulent matter.

8. In many animals, there forms in the lungs verminous, and glanders deposits, which ought to be distinguished from true tubercular matters.

9. In the quadrumana, and some birds brought from warm countries to our climate, the occurrence of phthisis is so frequent, as almost to exclude all other diseases. Its production seems to be equally favoured by the transport of some animals, as the rein-deer, from northern regions, and the change of diet consequent thereon.

10. Consumption, which is rare in the solipeds in domestication, is still

more rare in the carnivora. Nevertheless, notwithstanding the preserving influence of a strong constitution, and an animal diet, several of the carnivora, as the cat, lion, tiger, jaguar, are attacked in this climate with pulmonary consumption. Phthisis is equally rare among birds, especially the rapacious ones.

11. The domestic dog and horse are less subject to tubercle than to cancer, a disease which Camper regarded as unknown in animals.

12. In the Ruminantia, but especially in the bovine species, phthisis is often associated with vesicular worms, and, in particular, with the echinococcus; but, contrary to the opinion often promulgated, there is no necessary connection between the transformation of these hydatids into tubercle, or their being followed by tubercle.

13. The fatty degeneration of the liver generally indicates phthisis in man, but only general obesity in birds.

14. The alterations of bones observed in tubercular monkeys, and especially in those of the New Continent, appear analogous to the deformities, or swelling and softening of the bones, observed in phthisical and scrofulous children. Similar changes are sometimes observed in the bones of the carnivora of warm latitudes when brought to this country.

15. If the frequency of pneumonia, and the rarity of phthisis in the dog seems to indicate a want of connection between these two diseases, it is otherwise in the calf, in the cow, and she milk-ass, in whom the deposit of tubercular matter almost always depends on the presence of a chronic and progressive pneumonia.

16. Phthisis is hereditary, but almost never congenital, even in a rudimentary state.

17. In the phthisical the semen contained in the *vesiculæ seminales* contains few or no spermatic animalculæ.

18. The ulcers of the larynx, trachea, and bronchii do not indicate the presence of the same disease in man and all animals. In man they almost always indicate the presence of phthisis, sometimes of syphilis; in the quadrumana, a general tubercular affection; in the solipeds, almost always glanders.

19. In pneumothorax, mould may form on the altered pleura of a phthisical patient, as occasionally it forms in the respiratory organs of birds affected with tubercle, or other lesions of these organs. In this case, as in all others where it has been observed in the vertebrata, the development of these inferior vegetables is always a secondary phenomenon.

Frequency of second attacks of Small-pox. By M. SERRES. (*Comptes Rendus des Seances de l'Academie Royale des Sciences*, 4th July 1842.)—M. Serres stated that, from the observation of 1500 cases of small-pox, he had arrived at the conclusion, that secondary attacks of small-pox were as common after small-pox itself as after vaccination; that, in fact, vaccination had the simple effect of preventing a first attack of small-pox, being merely of the same efficacy as an attack of small-pox itself.

Identity of Cow-Pox and Small-Pox. By Dr MUHRY of Hanover. (*Provincial Medical and Surgical Journal*, May 1842.)—Dr Muhry states that Dr Reiter of Bavaria variolated fifty cows, and once succeeded in procuring a pustule with the matter, from which he vaccinated a child, but, alarmed by the appearance of a secondary eruption of vesicles, he took the disease for variola, and discontinued the propagation. The disease, however, was in the cows accidentally propagated, and seemed to afford a valuable proof of the identity of the two diseases, variola and vaccinia. The cow which produced the pustule stood in the same stable with another, and the latter in about three weeks thereafter showed excellent cow-pox. The

same happened also in another stable, and from both these infected cows children were inoculated, and showed very fine well-characterized cow-pox. It is further stated that Dr Gassnar in 1801 inoculated eleven cows, one of which only was affected. With the lymph from the pustule of this cow four children of a clergyman were inoculated, in all of whom a pustule was produced having the characters of genuine cow-pox. From these seventeen children were vaccinated, when the matter was lost in consequence of neglecting to take a supply at the proper time.

On the Identity of Chicken-Pox with Small-Pox. By Dr E. COALE. (*American Journal of the Medical Sciences*, January 1842.)—In a paper on "Sea Scurvy as it occurred on board the U. S. Frigate Columbia," in mentioning the disasters which befel the crew previous to the eruption of that disease, Dr Coale states, that "a few days after leaving Rio, where the small-pox was prevalent, an eruptive disease broke out, taking, in the first five cases, the mildest form of chicken-pox, but gradually increasing with almost every new case until, five months afterwards, we lost three men with the worst form of confluent variola or varioloid; having, in the meantime, touched at no port where we could ascertain the existence of either of these diseases, and the men never having left the ship."

On the cure of Hysteria by means of Ergot of Rye. By M. NARDO. (*Memoriale della Medicina Contemporanea*, January 1842.)—In two varieties of hysteria, M. Nardo has found the internal administration of the ergot of rye followed by the rapid removal of the disease, viz. in that seeming to depend on simple atony of the genital system, and in that depending on atony of the nervous and genital systems. His practice consisted in administering about a scruple of the ergot with sugar in divided doses each day, intermitting the dose every third or fourth day. A number of cases are shortly related proving the efficacy of the practice, the hysteria and the irregularity or absence of the menstrual secretion being removed at the same time.

On the employment of Cimicifuga and Iodine in Pulmonary Consumption. By Dr HILDRETH. (*American Journal of the Medical Sciences*, Oct. 1842.) Dr Hildreth has found great benefit from the internal use of decoction of the cimicifuga or black snakeroot during the first stage of pulmonary consumption, that stage characterized by the presence of induration either granular or diffused, in the lungs. When there existed much cough and bronchial secretion, a strong decoction of the root was administered in tablespoonful doses till vomiting was produced, frequently in combination with minute quantities of tartar emetic; blisters, or tartar emetic ointment, was applied locally to the chest, and when hectic fever and night perspirations existed, an alterative was given during the day, and five grains of acetate of lead, and three of Dover's powder in the evening. After this the decoction of the root was given daily every three hours, in doses proportioned to the strength of the patient, never carrying the dose the length of producing vomiting. When the inflammatory symptoms were reduced there was added, three times a day, ten drops of the following iodine mixture:—Iodine 10 grains, hydriod. potass. 20 grains, water 1 oz.; and an anodyne every night. Under this treatment most of his patients recovered, and a few cases are related, together with their stethoscopic signs, as illustrations of his mode of cure, and the nature of the cases.

The unripe Fruit of the Diospyros Virginiana a powerful Astringent. By Dr METTAUER. (*American Journal of the Medical Sciences*, October 1842.) The fruit of the persimmon when unripe is a powerful astringent. Dr Mettauer was induced to administer an infusion of it to a child labour-

ing under a severe attack of *cholera infantum*, which the usual remedies had failed to relieve. A tea-cupful of boiling water was poured on half a dozen half-grown persimmons slightly bruised. The infusion was then sweetened, and a tea-spoonful administered every second hour. The discharges from the bowels rapidly abated, and the child soon recovered. Since then, Dr Mettauer has employed the same infusion in similar cases with the most perfect success, and has found it equally efficacious in stopping the discharges in the diarrhoeas both of the child and of the adult. In chronic dysentery, uterine hemorrhages, and menorrhagia, the same fruit has been successfully used. In the cure of diarrhoea and dysentery it is advisable to conjoin the persimmon with rhubarb or senna. The infusion is the best preparation, and fortunately the fruit can be easily procured when diarrhoeas and dysenteries are most common. A vinous tincture, which keeps well, may be prepared by digesting one pound of green persimmons slightly crushed in a pint and half of port or other wine; the dose for an adult being from a tea to a table-spoonful. It is a pure and powerful astringent. The medicine should always be sweetened with refined sugar.

Diabetes Mellitus cured by Hydrochloric Acid. By Dr GENNARO FESTEGGIANO. (*Il Observatore Medico*, Feb. 1842.)—The subject of this case was a seaman, who, after remittent fever with gastric and rheumatic complications, became affected with an increased flow of urine, which gradually assumed the characters of *diabetes mellitus*. His urine was passed in great quantity, and had a sweet taste; he had a ravenous appetite, constant thirst, became thin, and had the other symptoms which usually attend that complaint. Dr Festeggiano prescribed a drink acidulated with hydrochloric acid, to which small doses of ipecacuan were added. At the end of eight days the peculiar symptoms had notably diminished; the morbid characters of the urine disappeared; and by the end of a month the patient left the hospital cured.

SURGICAL PATHOLOGY.

Statistics of the results of the more severe operations in the Parisian Hospitals from 1836 to 1840 inclusive. By M. MALGAIGNE. (*Archives Generales de Medecine*, April 1842.)—During these five years 852 amputations of one kind or other have taken place. Of 201 amputations of the thigh 126 died, or 62 in the 100, very nearly two-thirds. Of this number 46 were operated on for traumatic lesions, of whom 34 died; 135 for spontaneous affections, of whom 92 died. Of 192 amputations of the leg 106 died, or about 55 in the 100. Of these 79 were for traumatic lesions, which furnished 50 deaths, and 112 for organic lesions, giving 55 deaths. Thirty-eight partial amputations of the foot took place, of which number 9 only died, or 24 in the 100; 29 of these were on account of organic affections, and furnished 3 deaths; 9 were from traumatic causes, of whom 6 died. Disarticulation at the shoulder-joint was performed 14 times. One case had the thigh amputated at the same time. Of the 13 remaining cases 10 died. Of these 13 cases 6 were on account of organic lesions, of which number 3 died, 7 for injuries, the whole of whom died. Of 91 amputations of the arm 41 died, or 45 in the 100. Of these 61 were on account of organic lesions, 24 of whom died, 30 on account of traumatic lesions, of whom 17 died. In 28 cases amputation of the fore-arm was performed, 8 of which number died, or 28 in the 100. Of that number 17 were on account of organic affections, of whom 5 died, and 11 on account of injuries, of which number 3 died. Sixteen amputations at the wrist took place, all of whom recovered. Removal of metacarpal bone, 9 cases, 1 death; of metatarsal 8 cases, 1 death. Amputation of great toe, 43 cases

7 deaths; of other toes 33 cases, 2 deaths. Amputation of the thumb 9 cases, 3 deaths; of the fingers 133 cases, 11 deaths; of separate phalanges 24 cases, 1 death.

It thus results, that, of the cases where the cause of the amputation was ascertained,

524 pathological amputations furnished 139 deaths or 38 in the 100.

265 traumatic amputations ... 103 ... or 49 in the 100.

Note.—Accustomed as we are in this country to a much higher average of recoveries, more especially in the more severe operations, as in amputations of the thigh, leg, and arm, it seems not unworthy of the attention of the French surgeons to inquire into the probable cause of the greater amount of mortality with them. For ourselves, we have little hesitation in attributing no small portion to their adherence to the circular mode of amputation, by which it is extremely difficult, nay impossible, to produce adhesion by the first intention, which of itself greatly diminishes the danger, and of course the mortality. Their mode of operating has, besides, the disadvantage of exposing the patient to a long and tedious process of healing by granulation, during which the discharge from the large surface exposes still further the exhausted patient to have his health completely destroyed; in fact, it is keeping up the very irritation and drain, which in the organic lesions was the cause of amputation being performed. Besides all this, even when the stump is healed, or is in progress of healing, the bone often projects, and requires to be removed by means of the saw, or is so imperfectly covered as to form a source of frequent annoyance. All these evil consequences are, as far as possible, obviated by the flap operation. In it, if adhesion by the first intention do not take place, the parts are not in a worse condition to be healed by granulation. The discharge is never likely to be so great, as the parts are in the most favourable situation for uniting—muscle being opposed to muscle, skin to skin; and the bone is furnished with a sufficient covering both of muscle and of skin to prevent its protruding, and thus retarding the cure. The muscle, besides, forms the best possible pad for the extremity of the bone to rest on, as it is now satisfactorily ascertained that it becomes converted into a tendinous structure, which is not the least painful on pressure.

On Stricture of the Urethra. By M. CRUVEILHIER. ((*Archives Generales de Medecine*, Sept. 1842.))—After enumerating the various diseases of the bladder, to which stricture of the urethra may give rise, M. Cruveilhier states, that writers have erred in enumerating many organic alterations as the cause of permanent stricture. In all his dissections, he has found but one cause present, viz. fibrous degeneration of the urethral canal at the point of stricture. This alteration of structure may only occupy one point of the canal, and constitute a circular narrow stricture, or it may extend over a greater surface, and narrow the canal through an extent of from six to twelve lines. In some cases, the diseased structure is confined to the mucous membrane, in others, to the whole thickness of the coats of the urethra. This fibrous transformation, he thinks, may be owing to two causes, either to chronic inflammation of the mucous membrane, or to ulceration; the last being the most probable, as he cannot understand how the inflammation could be limited to the membranous portion of the urethra, at which point these strictures constantly occur. If these facts are admitted, they prove, says he, the worthlessness of forcing a passage by means of catheters and conical-pointed sounds, as well as of cauterizations, and the necessity of removing the constriction by means of gradual dilation, continued for a very long period. These observations seem also to prove that the strictures have a constant tendency to return, and that stricture once produced can never be completely cured.

Lithotomy in America. (*American Journal of the Medical Sciences*, October 1842.) Dr Nott, in a paper on lithotomy, mentions the astonishing fact of Professor Dudley of Kentucky having operated on 153 cases, and lost only four of them. This extraordinary success is attributed to the great care taken in preparing the patients for undergoing the operation, the dexterity of the operator, and the pure air which the patients breathe at Lexington, where Dr Dudley resides. Dr Nott recommends the breaking all large stones previous to extraction, and states, that, in his practice, the mortality is diminished in consequence. He employs rather a novel means of removing all the smaller fragments from the bladder,—viz. injecting a stream of water into the bladder by means of a wide catheter passed through the urethra, while the patient is sitting over a chamber pot. Every fragment is thus washed through the wound.

Successful and safe mode of removing Hemorrhoids by Operation. By PROFESSOR HORNER of Philadelphia. (*American Journal of the Medical Sciences*, October 1842.) For some days previous to the operation the rectum should be cooled by repeated injections of cold water. This is an important precaution, and greatly diminishes the danger of the subsequent operation. The pile being caused to protrude in the usual manner by straining, a strong needle armed with a ligature is passed through the upper part of the base of the tumour. The needle is then removed, and the two ends of the ligature tied together so as to form a loop. A stout awl is then passed in a line parallel with the ligature, through the lower part of the base of the tumour. These give a perfect command over the tumour, and render easy the subsequent steps of the operation.

The inferior third of the base of the tumour is now detached from the internal sphincter muscle by means of a scalpel, together with the enlarged anal sacs, and a corresponding loose fold of skin which usually accompanies the hemorrhoid. A wire noose is then passed round the still adherent base of the tumour, and drawn perfectly tight by means of a double canula, after which the awl is removed. If the tumour be large, it may now be punctured so as to disgorge the blood. At the end of five hours the part is dead, and may be cut off about three lines from the wire noose. No bleeding follows, as the vessels are deadened and compressed by the wire ligature, which is now removed. A drachm of the tincture of opium in two ounces of starch, is given by injection, and the patient usually falls into a tranquil sleep and has no farther suffering or annoyance.

It is of importance to detach well by the first incision the base of the tumour from the internal sphincter. If this be neglected a plexus of veins is cut through, instead of being lifted up and included with the tumour, and a fold of tegument is also left, which swells up and gives as much annoyance as the original hemorrhoid; both may be removed with care. This plan has been found preferable to all the plans in ordinary use, possessing "the signal advantage of reducing pain and counteracting hemorrhage."

On the occurrence of non-union in Fractures, its causes and treatment. By GEORGE NORRIS, M. D. of Pennsylvania. (*American Journal of the Medical Sciences*, January 1842.) Dr Norris, from a careful review of 150 cases of ununited fractures, collected from the works of the chief surgical writers in France, Britain, and America, and also from his own practice, has been enabled to publish a more satisfactory account of the causes of this want of union, and also of the most likely methods of cure than is presented in any other work or paper on the same subject. He demonstrates that the mode by which bones are united is first by the formation of an increasing bony shell or provisional callus, which holds together the broken extremities till the glutinous matter which is thrown out between

them becomes ossified, and the surface becomes united. The provisional callus then becomes absorbed; the medullary canal becomes hollowed out of the newly formed bone; the cells and bony canals appear in this part; the periosteum and medullary membrane return to their natural state, and the work of consolidation is terminated.

The knowledge of this process throws light on the appearances observed in ununited fractures. Dr Norris describes the mode of union in these cases under four heads.

1. The bones surrounded and united by a cartilaginous mass, from the process of consolidation having apparently stopped, when osseous matter should be deposited.

2. An entire want of union between the fragments, the ends of which are diminished in size, and extremely moveable; the limb hangs perfectly useless.

3. The medullary canal is obliterated in both fragments, and the ends of the bones rounded, or pointed, and covered by a tissue resembling periosteum, but connected by strong ligamentous, or fibro-ligamentous bands, passing from the one extremity of the fractured fragment to the other. This is the most common class of cases.

4. A dense capsule similar to the capsular ligaments, without opening of any kind, and containing a fluid similar to synovia, is formed. The points of the bones corresponding to each other are either eburnated or covered with points or incrustations of cartilage, and a membrane similar to the synovial. In this form the limb is often of considerable use to the patient.

The causes of the want of union of the broken bones are considered under two heads, constitutional and local. The constitutional causes are referred to the existence of syphilis, pregnancy and suckling, cancer, fragility of the bones, scurvy, low fevers, general impoverishment, or bad state of the system, low diet, want of nervous influence, cutting off the direct supply of blood, the effects of season and atmospheric influences. Dr Norris shows that though these causes do occasionally seem to prevent osseous union, that they are often present, and yet perfect and speedy union occurs. The local causes are referred to, 1. frequent motion of the part; 2. the fractured ends being widely separate; 3. disease of the fractured extremities; 4. the interposition of foreign bodies between the fragments; 5. tight bandaging; 6. the long continued use of cooling applications; 7. the too early use of the fractured limb.

After enumerating the twenty-three modes of treatment which have been at various times resorted to by different surgeons, he refers the whole to the five following distinct heads.

1. Compression and rest. Of 30 cases of ununited fracture recorded by others, or seen by Dr Norris, which were treated by this means, 29 were cured. Of these 13 were in the femur, and of these 9 were cured; 7 in the leg, all cured; 12 in the humerus, 9 cured; 4 in the forearm, all cured. In no case was the treatment followed by death. This mode of cure is especially adapted to the first class of cases above noticed.

2. Frictions of the extremities of the bones against each other. This mode is peculiarly well fitted for the second class of cases, those in which no union exists, or where the bonds of union are slight. In only one recorded case, this mode of cure was followed by unpleasant symptoms, yet even in this case the person did not die. Of 11 recorded cases so treated all recovered.

3. Seton. This plan appears to have been adopted to a much greater extent in America than in Europe, and Dr Norris, who has collected together the result of 46 cases, states, "that results in America have proved it one of the safest, least painful, and most effectual of the numerous operations that are performed for the cure of pseudo-arthritis. The seton should

be removed so soon as a sufficient degree of suppuration is excited, but before profuse suppuration is established." Of the 46 cases related as being subjected to this treatment, 21 had an incision made down to the bone previous to the passing of the seton; of these 17 were cured, 2 amended, 1 failed, and 1 died. In 24 cases, the seton was passed through the limb without previous division of the soft parts; of these 18 were cured, 1 relieved, 4 failed, and 1 died. Of the whole 46 cases, 13 were in the femur, of which 9 were cured; 10 on the leg, all cured; 16 in the humerus, 10 cured; 6 in the forearm, all cured; 1 in the jaw, cured. Troublesome accidents depending on the mode of cure occurred in 12 cases; these were arterial hemorrhage, severe fever, erysipelas, and profuse suppuration.

4. The application of caustic to the seat of the fracture. This plan is only to be followed when the above simpler means have failed. The bones are cut down on, the bonds of union fairly cut through, and the whole surface freely rubbed over with caustic. Dr Norris gives the preference to the caustic potash. Of eight cases treated by caustic six were cured, and two received no benefit.

5. Resection of the ends of the bones is a very severe and dangerous operation, and never to be resorted to until all other means have failed. Of 38 recorded cases, 24 were cured, 1 amended, 7 failed, and 6 died. Of these 12 were in the femur, of which 7 were cured; 6 in the leg, 5 cured; 12 in the humerus, 6 cured; 7 in the fore-arm, 5 cured and 1 amended; 1 in the jaw, cured. Severe symptoms dependent on the treatment, yet not terminating in death, occurred in 9 cases.

Abscess of the Tongue. By Dr GRAVES. (*Dublin Journal of Medical Science*, January 1842.)—A man. 30 years of age, presented himself at the hospital. His tongue was painful, increased in volume, especially at its left half, in the centre of which was a well-defined hard tumour, extremely painful to the touch. His deglutition was difficult, and his articulation indistinct. His pulse was 90, hard, and full. The next day, on the inferior surface of the tumour, a softened spot was detected, a puncture made into which gave issue to a quantity of thick, yellowish, and fetid purulent matter. The relief was instantaneous, and he quitted the hospital the same evening.

Operation for an Artificial Anus. By M. AMUSSAT. (*Comptes Rendus des Seances de l'Academie des Sciences*, 4th July 1842.)—M. Amussat read a paper before the Academy of Sciences, on the possibility of forming an artificial anus, by making an opening into the colon in the lumbar region without opening the peritoneum, an operation which may be performed even on infants who have no anal aperture. M. Amussat states that he is in possession of 7 such cases, 5 of which occurred in adults and 2 in new-born infants. In the adult the operation may be performed on either side, the left, however, is the preferable situation in most cases. By it defecation is more easily accomplished than when the opening is made at the right side. The same causes lead to the left being the preferable side for the operation in children, with the additional reason that the voluminous liver often presses the colon on the right side out of its place. He prefers making the incision transverse in this operation, but states that a vertical incision is sometimes required in the bottom of the wound in the adult, in order to facilitate the operation, and allow the colon to be sought for, as there is no fixed point to guide us in the operation. In the infant, however, the kidney serves as a guide to the colon, as the relative position of these two organs is fixed at that early age. In the child, however, the operation ought never to be performed unless it is absolutely impossible to establish an artificial anus in the coccygean region. The infirmity which

results from this operation is much less than what might be imagined, as the colon does not evacuate itself involuntarily and continually, as takes place with an opening communicating with the small intestines.

OBSTETRICS.

Probable Case of Superfœtation in a biclular Uterus. By M. BILLEN-GREN. (*L'Experience*, 24th Nov. 1842.)—A woman, 40 years of age, who had born several children, about the sixth month of pregnancy began to suffer from uterine hemorrhage. It was arrested for a few days, but soon returned, gave rise to uterine contractions and the expulsion of a fœtus, which from its appearance could not be more than a three months fœtus. On examining the uterus another fœtus was discovered, which was extracted by means of the forceps. This fœtus was well-developed, had the appearance of a seven months fœtus, was alive, and lived for some time. Each of these fœtuses had their separate placentas, which strongly adhered, requiring the introduction of the hand for their removal. By this means, it was ascertained that the uterus was divided into two cavities, beginning just within the lips of that organ, and that each of these cavities contained a placenta. From the inequality in size of the two fœtuses, and their appearance, the author states that he was forced to admit this as an undoubted case of superfœtation, though somewhat similar cases have been usually described as those in which one fœtus has, at a certain period, been arrested in its development.

Metastasis of Leucorrhœal discharge to the Umbilicus. By M. OTTANI. (*Gazette Medicale de Paris*, 3d September 1842.)—A woman subject to leucorrhœal discharge had it suppressed after a week's medical treatment, by means of sulphate of zinc injections, and iron internally. Very shortly after this she was seized with violent abdominal pains and general uneasiness, which resisted all remedies till a discharge of clear yellowish matter, precisely similar to that of the leucorrhœal, commenced exuding from the umbilicus. This discharge of matter continued for more than a month, when the leucorrhœal discharge returned, and this abdominal secretion immediately dried up, and has not since returned.

TOXICOLOGY.

Cases of Poisoning by Sausages. By Dr ROESER. (*Medicinisches Correspondenz-blatt*, July 1842.)—The family of Ehrmann at Limmethausen with a number of guests partook of a supper of pork sausages, in consequence of which all were more or less affected with symptoms of poisoning, eight with severe symptoms, and three died. The sausages were made of the liver of a healthy pig, prepared eight days previously, slightly boiled, then smoked, and hung up. There must have been something peculiar in the taste of the sausages, as one of the guests remarked that they were not wholesome, and did not partake of them, in consequence of which he escaped. The symptoms were similar in all, differing merely in degree. Shortly after partaking of the sausages, pains in the bowels, vomiting, giddiness, dryness of the mouth and throat, and difficulty of swallowing came on. The pupils soon became dilated and fixed, the headach and vertigo increased, and the power of vision was destroyed. Great prostration of strength followed, the power of speech was lost, the abdomen painful to the touch, the pulse small, weak, and frequent, and at last intermittent. The respiration became difficult, the power of swallowing was lost, lividity of the countenance came on, spasms of the muscles of the extremities and rapid death. The deaths occurred within 36 hours after eating the sausages.

The morbid appearances were analogous in the three fatal cases. The brain and spinal marrow were healthy, the sinuses filled with dark blood,

but the veins of the *pia mater* not injected. The palate and tonsils red; the last much larger than natural, and covered with small suppurating abscesses. Ecchymosed spots on the tongue, and the papillæ on its posterior part injected and prominent. The lining membrane of the larynx and epiglottis of a deep-blue colour, and their vessels much enlarged in size. The tracheal membrane to the bifurcation of the bronchii of a deep or blackish red colour, marbled with clear spots, sanguineous suffusions, and vascular net-works. The bronchii were of a deep-red colour and filled with bloody mucus. The lungs were of a deep-red, gorged with blood, did not crepitate on pressure, and were friable. The left lobe of the liver was livid and flaccid, the other parts of a clear brown, and friable. Gall-bladder full of black bile. The spleen was double its usual size, and in consistence and appearance resembled the lees of wine contained in membranous cells. The œsophagus was of a remarkable white colour, covered with a white false membrane. The stomach was natural in appearance externally, but its internal surface presented a marbled appearance, especially towards the cardiac orifice. The intestines, on their peritoneal surface, presented a grayish-black appearance mottled with red spots, as occurs in some forms of enteritis. The duodenum internally was of a black colour, the other portions of the intestines nearly healthy, only here and there arboriform injection and ecchymosed spots were seen. The kidneys were of a deep-red, and gorged with blood; the bladder full of urine. The other organs were apparently healthy.

Sale of Cocculus Indicus. (*From Annals of Chemistry*, p. 384, No. 12, Vol. 1.)—*To the Editors of the Annals of Chemistry and Pharmacy.*—GENTLEMEN,—As you have given an article, a few numbers back of your excellent Journal, on the Sale of Poisons, perhaps you will not object to inform your readers what you know about the extent of the sale of *Cocculus Indicus*; a drug said to be much employed in this metropolis, but I am not aware that it enters into any medical composition, or that it is useful in any of the arts of life. It is allowed to be a poisonous vegetable production, and the evidence of this rests on high scientific testimony, as we learn from the best works on Toxicology. I suspect it is largely employed in adulterating malt liquor, and that the public health is materially injured by it. It acts strongly on the brain and spinal marrow, and will produce stupor, convulsions, and all the sad train of effects arising from a disturbance in the functions of the nervous system.

Now, we hear much of the cases of accidental poisoning, but the systematic wholesale poisoning is comparatively unheeded. It is to be deplored that the article, and its extract, find a place in our Tariff, thereby introduced into the country under the sanction of government.—I am, gentlemen, your obedient servant,

MEDICUS.

London, Oct. 24, 1842.

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PART I.
ORIGINAL COMMUNICATIONS.

ART. I.—*Medical Notes on Syria ; or Practical Observations on the Diseases there treated during a residence of thirteen months, including Remarks on the Country, its Climate, People, Resources, and an account of the Plague as it occurred in Bairout in 1841.* By EBENEZER ROBERTSON, Lic. R. C. S. E., Surgeon Royal Navy, and Medical Officer attached to the British Staff and Ordnance Detachments serving in the expedition to Syria in 1840 and 1841.—In a Letter to Sir William Burnett, Kt. M. D.

Edinburgh, November 1842.

SIR,—IN accordance with your wish I have compiled the following Medical Notes on Syria, which I now present to the public under your auspices.—I am, &c. EBENEZER ROBERTSON, Surgeon Royal Navy.

Preliminary Remarks.—For some years prior to 1840, the eyes of the whole of Europe had been anew directed to Syria, watching the gradually advancing victorious army of Ibrahim Pacha, which, wresting town by town, fort by fort, district by dis-

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trict, from its lawful lord the Sultan, at last compelled the whole to bow in subjection before it ; then gaining, passing, and fortifying the defiles of Taurus, occupied Smyrna, and seemed to threaten the gates of Constantinople itself. After diplomacy had failed to bring to a proper understanding, the wholesale murderer of the Mamelukes, and to cause the usurper of Egypt's throne, and the invader of Candia and Syria, to return in allegiance to that power against which they had first rebelled, and which they then denounced, Syria's coast was blockaded, and those hostile operations were commenced, which terminated in the downfall of that almost impregnable fortress, St Jean d'Acre, before whose walls Napoleon was repeatedly repulsed, and at last compelled to raise the siege ; the averted destruction of Egypt's far-famed town by the Napier convention ; the return of Ibrahim with his shattered army to the land ruled by his father ; the surrender of the Ottoman fleet, and their subjugation and renewed allegiance to the descendant of the illustrious Saladin.

It was immediately after the capture of St Jean d'Acre, November 1840, that the author became attached (through the kindness of Captain H. Stewart, C. B. of H. M. S. Benbow,) to the Staff of Major-General Sir C. F. Smith, and remained serving in that ill-fated and distracted land till December 1841, during which period ample opportunities were presented of observing, and carefully noting those diseases which shattered the ranks of our forefathers, the Crusaders, and caused many to leave their bodies a prey to the night prowling jackal and their bones to whiten on a still whiter soil, and which committed such extensive ravages amongst the British officers and men who served in that late expedition. Amongst those officers who fell victims to the influences of the climate, he would beg to notice with feelings of deep regret the names of Brigadier-General Mitchell, C. B., Colonel Bridgeman, Lieutenant-Colonel Walker, Major Bocchiciampi, and Count Zechini,* whose names and highly esteemed qualities will long be remembered, and lamented by those who had the pleasure of serving under the three first, and with the two last.

From notes, made during the above period, a condensed account of these diseases and their most probable causes was presented on the author's return to England, to Sir W. Burnett, who, being pleased to express the opinion that they should be given to the public, the author has attempted this duty in the following paper.

It is divided into three distinct parts : the *first* comprises a few introductory remarks on the general appearance of the country, its people, medical resources, &c. ; the *second*, a description of

* This officer, the scion of an illustrious Austrian house, a few days before his anticipated return to the " land of his fathers," fell a victim to the plague at Damascus.

the diseases observed ; the *third*, an appendix containing tables, &c.

The author avails himself of the present opportunity for the purpose of publicly expressing his thanks to the various officers under whom, and with whom he had the honour to serve in the expedition, for the support he always received in the execution of his varied duties, and for the many acts of personal kindness received at their hands.

PART I.—General Description of the Country, including Remarks on its Climate, Seasons, People, Diseases, Medical Establishments and resources, &c.

Introductory Remarks.—Syria, apart from the very lively interest which it must ever excite in the mind of Christians, from the associations by which they are bound to that portion of it, Palestine; that land

“ Over whose acres walked those blessed feet
Which eighteen hundred years ago were nail'd
For our advantage to the bitter cross,”

presents an ample field for labourers in every department of scientific investigation. Its resources are such, that it will afford equal delight and recompense to the historian, the antiquarian, the mineralogist, politician, military officer, physician, or amateur traveller. Each will there find sufficient scope to exercise those talents with which he has been endowed.

§. I.—This tract of country presents a varied and ever-varying scene, arising not so much from its extent, which does not exceed 300 miles from north to south, (or from Mount Taurus to the Arabian Desert,) or 100 for its greatest breadth, (or from the Mediterranean to Diarbekir and Euphrates,) as, from the irregular conformation of its surface, being intersected in the direction of its length by almost continuous ranges of mountains, the rugged peaks of some of which rise to upwards of 10,000 feet above the level of the Mediterranean Sea, which washes the whole of its exposed western coast; whilst the bases and lower ridges of the more alpine parts, and the whole of the lower ranges are richly clothed with luxuriant vegetation, some of the latter bear upon their summits the cedars of Lebanon, and the sides of both present successive terraces, which are thickly studded with the mulberry, olive, fig, vine, almond, &c. Here and there where nature has been more indulgent, the flattened surfaces and intervals of the rocks present a soil evidently formed by the accumulated and gradually accumulating detritus of many years, bearing not too abundant crops of barley, wheat, cotton, and maize.

The plains extended, in the intervals of the mountain ranges,

skirting the barren desert, or stretched along the sea-coast, afford to the eye of the traveller, either pasture-lands, animated by numerous flocks and herds, or gardens studded with the mulberry, interspersed with olive trees, palm trees, and clusters of dark foliaged pine, or orchards, boasting of the orange, pomegranate, lemon, fig, cactus, &c., which last, though principally used for hedgings, affords by its fruit no mean article of diet for the poorest classes. To the southward and eastward, are less rugged hills and more extensive plains waving with undulating crops of corn, &c., both of which become mingled with the waste howling desert.

The banks of the rivers and streams are decked with the richest foliage of some of the finest eastern flowering shrubs, evergreens, and plants, amongst which we may mention the laurel, laurustinus, bay-tree, plane-tree, sycamore, myrtle, oleander, fig-tree, wild vine, arbutus, &c.

Certain places and districts are still celebrated as of old for their productions. Aleppo for her not to be excelled pistachio nuts ; Latakia and Djebail stand unrivalled for their tobacco, so prodigally used by both sexes ; Tripoli for oranges ; Jaffa for lemons ; Gaza for dates ; and Damascus for her fruits, and for her highly-prized sweets and preserves, which have gained for her a name over the whole world. The manufacture of sword-blades, by which she was best known, is now extinct. The Druses, &c. are still celebrated for their beautiful white silks interwoven with gold, &c.

If we turn to the geological formation of those ranges of hills, and, starting from Lebanon as a centre, we proceed to the northward or southward, we shall find the following brief description to convey a faint idea of the formation of this interesting land. The great mass of the Lebanon range, (*Libanus et Anti-Libanus*,) stretching as it does from Acre to Tripoli, is composed of limestone, the strata of which, on the western side, dip towards the sea, whilst those on its eastern incline in an opposite direction. On the summits of the highest peaks they become horizontal, the whole conveying to the mind the impression of some force acting from beneath, having pushed them directly upwards. Immediately subjacent to this limestone is a formation of sandstone, averaging from 500 to 600 feet in thickness, and which may be observed coming out in various places throughout the whole extent of the range. In many points between the above-mentioned formations will be found formations of globular basalt, whilst in a few there appear amygdaloid, and in others amorphous greenstone. Quartz is very abundant. Fossil fish, of which specimens showing the smallest lineaments and fibres of their fins and other parts of their structure, may be easily procured, exist in great

abundance in two localities only; one above Djouni, the other above Djebail. Shells of the univalve, bivalve, and spiral forms exist throughout the whole range, incorporated in the limestone or held together by a species of cellular tuff, which is very hard, brittle, sonorous, and interspersed with numerous micaceous particles. Fossil plants are found above Deir-el-Khammar. Coal exists in one locality only, (as far at least as present investigation has gone,) at Corneil. It was wrought during Ibrahim Pacha's government of Syria by an enterprising British engineer. Proceeding in our investigation to the northward of Tripoli, where the Lebanon ranges are found to break down into the Ansarian hills, we find evident traces of volcanic action with lava, as if of very recent formation, showing itself in several parts of the surface. This range is formed principally of greenstone. To the northward of Latakia, (the ancient Laodicea in the sea,) and ascending the eastern side of Mount Cassius or *Djebel Ocrab*, we find first an abundant stratum of marl, then limestone, serpentine, and granite. The same succession, but reversed, will be found in descending its western side, sloping down towards the noble stream of the Orontes.* Amongst the serpentine and between the limestone and granite, are found abundant localities of jasper of every variety, but of all the varieties the red is most frequently met with. Here and there are portions of talc, and not far from the mouth of the Orontes, on its northern declivity, is a very large locality of crystallized gypsum. Iron is said to have been found here, and chalcedony and agate, which are rare in the Lebanon range, are very abundant. The same general description as that given of Lebanon applies in a great measure to those ranges which traverse Palestine, or to those smaller ranges radiating in various directions. Suffice in addition to remark, that granite, &c. exists around the Dead Sea, and traces of volcanic action are evident along the whole bank† of the Jordan and the lake of Tiberias, amply confirmed, if it were requisite, by the lavas, pumicestone, and other sufficiently well known results and effects of volcanic action everywhere observed.‡

§. II.—As regards the climate, seasons, &c. of this country, from the very brief outline of the general conformation of its surface, it is evident that, as we examine it and them, in the moun-

* The borders of this river, during the summer months, so swarm with the gadfly, that the inhabitants are compelled to shut up their houses and retire to the mountains.

† By Lt. Symons, Royal Engineers, the level of the Dead Sea was found to be 1312.2 feet below that of the Mediterranean, and that of Lake Tiberias, 328.98 feet.

‡ For these general remarks on the geological formation of the country, its author has to acknowledge himself indebted to Dr Van Dyck, Medical attaché to the American mission in that country.

tain ranges, the plains or the descents, or again, in its more northern or southern latitudes, so must we find it and them individually varying, presenting all imaginable varieties, from the cold or temperate mountain clime, to the tropical of the plain, or scorching one of the sandy deserts; or from the more severe wintry months in its northern latitude to the mild continental clime of its more southern districts; or, in the words of a late writer, "a journey of a few hours carries the traveller through a succession of seasons, and allows him a choice of climate, varying from the mild temperature of France to the blood heat of India, or the pinching cold of Russia."—(Russell on Palestine.)

The mountain districts may be viewed in the light of temperate, taking for our guide neither the extreme heights, which are covered with perpetual snow, or the lower ranges, between which and that of the plains no very distinct line of difference can be drawn. Although, during the summer months, the sun always exerts a very powerful influence throughout the day, assisted by the heat reflected from many a barren rock, yet the inhabitants are morning and evening refreshed by cool breezes, and by occasional showers of rain; which last the inhabitants of the plain in vain look for, from the month of May to that of November. In the plains, again, the heat during the same period is almost insupportable, the thermometer rising to 96° Fahrenheit in the shade. By some it is said to have at Damascus and Bâirout attained the great height of 120° Fahrenheit, but we have never seen it higher than already stated; whilst the breathless stillness which reigns supreme, and the atmosphere heated as by a furnace, in its passage over the neighbouring sands and sand hills, give the air a close suffocating sensation, which those who have the power avoid, by flying early to the mountains, where they can always reckon upon a cool refreshing night, inducing sound sleep—a boon denied to those whom necessity or inability compel to remain throughout the summer in the plains or low country. By a little management an equable temperature may always be obtained by gradually ascending or descending the mountains with the gradually increasing or decreasing heat. Such is the practice of some European families, who thereby are enabled, in this otherwise scorching land, to enjoy this the whole year.

In the mountain districts, although there occur irregular showers of rain throughout the whole summer, the regular rains do not set in till about the latter part of October, (passing showers foretelling their approach,) and continue till the end of November, when they then alternate with snow till the end of December, after which the latter alone exists, falling to a depth, varying, according to circumstances, locality, &c. from one or one and a-half to several feet. The snow lasts till the end of February or beginning of

March, when rain again succeeds, and occurs intermittingly till April or the early part of May, after which they count upon a continuance of fine weather till the end of October, the commencement of the regular rains, as above-mentioned. Ice is frequent in the mountain districts, and is said to acquire a thickness sufficient to bear a man's weight. It forms with snow a not expensive luxury in the summer months for those inhabitants who are unable to quench their thirst, or cool their parching mouths at the pure and refreshingly cold mountain stream. They prepare their ground when the frequently returning showers foretell the near approach of the rainy season, and sow immediately after the first fall of what they consider the rains, and calculate upon reaping early in July or late in June. In some districts the crops are said to be abundant, whilst in others they do not repay the labour expended. They still use the ox for ploughing or for "treading out the corn."

In the plains the rains are both later in appearing and last longer; but in vain do their inhabitants look for refreshing showers during the summer months; such a thing occurring would be looked upon by the superstitious community as auguring the approach of some disease or direct visitation of the Deity.

During the winter months, except in the northern latitudes, the rain may be said to alone exist; for rarely is snow observed in the midland and southern parts; and although during the night, the temperature may fall so low as to cause the freezing of the shallow pools of stagnant water, yet morning and evening the temperature will rarely be found to be below 40° Fahrenheit, and by mid-day the sun always exerts a powerful influence, and even in December's bleakest day the thermometer will be found to indicate a temperature of 50° or upwards; the rains being later of appearing, the preparation of the ground consequently, and the sowing season, are deferred till they have commenced; but the crops are much earlier and much more abundant. If we pass to the northward, we find a greater difference existing there than we could credit possible from so small an extent; there the rains not only occur a month or a month and a-half earlier, but the cold, which is severe, commences to chill the day considerably even in October; whereas to the southward the reverse is the case, the climate is mild, and becomes more and more so as you approach the desert, which bounds this territory to the southward and eastward. The extensive pasture lands and well-ploughed fields clothed even in January with richest green, and the soothing mildness of the air, &c. impress the mind with the conviction that severe cold never exists in those more favoured districts.

During the summer, the winds, which are frequently very oppressive, and, as if issuing from a furnace, prevail principally from

the S. and S. S. W. and E.; the sirocco of frequent occurrence, is most relaxing and oppressive; it lasts for several days at a time, but rarely above three or four; during the winter they are very variable, and seem to be intermediate between the N. N. W. and W., and E., E. S. E.; the months of December and January are very tempestuous, the squalls are sudden, and very severe whilst they last. Scanderoon and St George's Bay present the only safe anchorages for the winter months. Thunder is most frequent in the plains during the winter months, whilst the reverse holds good in the mountainous districts. When it does occur, it is usually attended with violent showers of rain, and not unfrequently by heavy falls of large hailstones. For temperature of plains see Table A, appendix 1.

As regards the comparative healthiness of the seasons, it may be stated briefly to be as follows. In the mountains the summer is looked upon as productive, not only of more diseases, but of diseases much more severe in their character, much more rapid in their course, and much more fatal in their termination than winter. It not unfrequently happens for persons walking in the streets to be suddenly struck dead. Five cases occurred in Deir-el-Khammar in the summer of 1841, and several in Bairout; but whether this arose from an apoplectic seizure, or a severe "*coup de soleil*," the author was unable to ascertain personally; but he was assured of the fact by authorities on whom reliance might be placed. He is inclined to believe that they are apoplectic seizures. In the plains and towns the diseases of winter are attended with greater severity, and with a greater mortality than those of summer, being characterized by a low adynamic state, which, although existing *a priori*, may supervene on diseases coming on with considerable excitement; this disease, the result of crowded or ill-ventilated towns and localities, exerts a sway not unlike the typhus of our own country during the winter, whilst it is scarcely known as a distinct disease in the more airy and original dwellings of the mountaineers. March and October are regarded by both with feelings of great dread, for, being the seasons of the rains, they are productive of remittents and intermittents, which commit sad havoc amongst them, besides being the seasons when the dreaded epidemics, small-pox, scarlatina, and plague pay their visits, more particularly in the plains. The years, as well as the seasons, differ as elsewhere in their courses, &c., but not materially so.

The principal products of this country are silk, olives, olive oil, figs, dates, raisins, madder root, nuts of various kinds, &c., with wheat, barley, oats, rye, maize, tobacco, &c. Wine is made but not exported, save by amateurs, as a specimen, or for a liqueur, for which, from the very large quantity of saccharine matter it contains, and its peculiar taste, in some districts, the country is well

fitted. Although this country presents extensive plains, has the greater part of its mountains, when practicable by terraces, converted into gardens, its valleys well stocked with gardens and orchards, yet from its disturbed state, which seems daily to become more considerable, the gradual decreasing population arising from many causes, the insecurity of property, the uncertainty of life, the insurrections and civil wars, which have for years convulsed, and still distract the country, the tyrannical oppression and extortion exercised by the Turkish government, and its despotic governors, the greater part remains uncultivated, and the quantity of produce raised is scarcely adequate to supply the wants of a people who, under a proper government, with encouragement held out, and oppression banished, might export considerable quantities, instead of being compelled to import, as they lately have done, the bare necessaries of life from both Candia and Egypt.

We have not made any reference to the scorching deserts, as they have already been well described by individuals who have had the opportunities presented of not only crossing them, but of living with the numerous hordes who infest them; and who have given to the world the few facts and incidents which they have been able to collect of a race which is here to-day and there to-morrow, now in the desert, then on the barren rocks, at one time living in tents, at another in crevices of rocks; but wherever they go have their all with them, women, flocks, herds, beasts of burden, &c.

§. III. The inhabitants of this country may be divided into three principal tribes,—the Arabs of the desert, the inhabitants of the mountains, and those who reside in the plains. In whichever tribe they are examined, they will be found to be generally well-formed and powerful, as far as regards at least the body; but great dissimilarity exists in the conformation of the skull. Whether this may be the result of their customs or not, we had not adequate means of deciding. It is not our intention to enter into minute particulars relative to each tribe, or the various subdivisions which have taken place, but merely to present a few remarks on the habits and customs of each, without going through the various sects and denominations, or the various ranks in which their society is divided.

The life of the first is of the wildest description, their habits and dress of the most primitive nature, their fare of the simplest kind. They are collected into various tribes, and when stationary sleep under tents, or in crevices of rocks; but when travelling, roll themselves in their camlet cloak, and, throwing themselves at their horse's feet, enjoy a repose which would be coveted by many. Their complexion is more or less of the olive. Their females have

charge of all domestic arrangements, and are in the capacity of slaves, more than that of companions or associates; but this last circumstance is not peculiar to them, for it extends over the whole country; and it is only from frequent intercourse with Europeans that we find a very few indeed permitting their females to sit in society, or eat from the same table as themselves. Their subsistence is derived from their flocks and herds, or from pillaging.

The inhabitants of the mountains are a remarkably fine set of people, as far, at least, as regards those of the Lebanon range; the men are more or less dark from constant exposure to the sun, whilst the complexion of the females is of the finest and fairest white. The male population is estimated at 60,000,* of which 45,000 are given to the Christian, and the remainder to the Druse. There are various sects of the former; but whilst they differ one from the other in their religious observances, and the whole from the Druse, they all agree in having much the same civil observances. They are divided into so many small dependencies, each having a sheik for its head. The sheiks collect the taxes, administer justice, regulate the community, and in the event of war, or on being called on to assist some other, call upon the armed male population of the district. The sheiks again differ in rank, in proportion to the number of men which they individually can supply. The inferior sheiks are bound to afford assistance to the principal sheik of the district, and they (the last) again are all bound to obey the call of the (prince) Emir, and that gratuitously,—not unlike the feudal system that formerly existed in Scotland. The two sects always have had great enmity towards each other, and their various rulers have always endeavoured to retain, if not to increase it, thereby preventing a coalition, which might have proved dangerous, if not fatal to their rule. But it is foreign to our subject to enter into any details, as to the probable causes of their feuds, &c. which have existed from time immemorial, and which are becoming more and more firmly rooted on each succeeding generation, by the occurrence or repetition of more horrid massacres, conflagrations, and pillaging than ever yet have defiled the history of any country.

They, for the most part, are collected into villages or towns; the houses of the Christians, in many instances, are handsomely built, and finely finished in the interior; whilst so much care or comfort does not pervade the rude mansions of the more warlike Druse; chopped straws and weed, with the unprepared boughs of trees, forming the sole materials of which their square, oval, or conical houses, are in many instances composed. The villages and towns (unlike those of the plains,

* This refers to fighting men only; multiplied by 2½ths, gives the whole population.

which are fortified and closely crowded,) have sufficient intervening space allowed for free ventilation, and hence the less apparent deterioration in their physical forms, which, in the towns of the plain, is obvious to the least inquiring eye.

The food of the two classes is very similar, and in both (save in the higher Christian families, who have learned to pamper their appetites,) is very sparing indeed, consisting chiefly of home-baked bread, rice boiled with fine oil, milk, green or preserved olives, vegetables and oil, a very small proportion of animal food, which is boiled down, and the thick gravy is eat with the rice. The milk is prepared in various ways, either curdled or put through a certain process, forming it into a thick paste, or made into cheese, which is very poor, and eaten always with oil. Their drink is principally water, or a small cup of coffee; but this cannot be said to be particularly observed by, or prevalent amongst, the Christian community as a whole, for many, following the example set them by their usually profligate priests, have deserted or abandoned the simple style of living of their forefathers, and exchanged the salubrious mountain stream, still solely partaken of by the Druse and more observant Mahometan, for the more exciting beverages of wine and arrack;* and hence have become heirs to many fashionable diseases, which are as yet unknown to their more temperate neighbours.

But it is not in this that they differ only; they differ also in their physical proportions and moral courage; and one, on viewing closely and disinterestedly the two tribes, born and nursed in the same mountain, inhaling the same air, living, with the difference spoken of above, upon much the same food, can scarcely believe that a difference physically and morally could possibly exist amongst a set of people, whose difference exists solely in their religion, and the consequences incidental to it; at least to such we are inclined to refer the absence of that moral courage so characteristic of the Druse, and the overweening conceit pervading the every action of the Christian, when danger is at a distance. Yet such is too true, and, preposterous though it may appear, and unaccountable as it is, yet the every-day experience of residents can testify to what has been advanced.

The dress, particularly of their females, is very picturesque, and accords well with their wild scenery and rude habitations. If we turn now to the inhabitants of the plains, huddled together into closely-built, crowded, fortified towns, we find that, by their difference in situation, occupations of life, and style of living, they have lost in a very great measure that

* Arrack, a pure spirit distilled from the grape, and mingled with aniseed, is used by the better classes to *stimulate* the appetite, and is administered twice or thrice before dinner.

expanded countenance and frame so characteristic of the mountaineers, and appear generally sickly and devoid of that ruddy glow of health which beams in the countenances of the inhabitants of those lands. They live much in the same style as the mountaineers; but whilst the latter leaves all domestic concerns, the cultivation of the gardens and orchards, and the tending of the flocks, in most instances, to the females or aged males, and wanders free as his native hills, the former is obliged to labour hard, and follow various pursuits to procure subsistence for supporting a life which seems to be devoid, in the majority of cases, of any pleasure save that of mere existence. The houses of the lower classes of both mountain and plain, more especially those huddled up in villages and towns, are generally in a state of extreme filth, and swarm with vermin of every description; and their want of personal cleanliness accords well with the state of their houses. Congenital malformation, which is frequent in the towns, is very rarely met with in the mountain districts. As we pass onward to the southward, and leave Carmel on one part, and Jaffa still farther to the southward behind us, we find a race of beings still if any thing lower sunk in the scale of creation. Apart as they are from any intercourse with Europeans, regardless of all but self, huddled together into villages, which scarcely boast of a single stone, they live in almost dark mud* houses, swarming with vermin and replete with filth, which serve them for rooms, sleeping apartments, stable, kitchen, &c.; the odour of which, in most cases, is insupportable, and the appearance of the squalid and scarcely human wretches is not equalled by the chiffoniers of Paris, or the rag-gatherers of our large towns. Viewing all circumstances connected with these last facts, and the closely-built and densely populated lower parts of the towns, with the uncleanness of the streets, the open common sewers, and the collections of filth every where observed, we have no reason to wonder that plague or other fearful diseases pay their visits, but that they are ever free from such baneful scourges, or have not ere this been entirely depopulated. The mountains are looked upon, on the whole, as healthy; longevity is not so frequent in the plains as we find it stated to be in them; some attaining the advanced age of 100 or 110. Congenital malformation also, scarcely known in the mountains, is of frequent occur-

* These last present different forms, square, irregular, or conical; the interior of the first has at one end or side an elevated portion (two or three feet in height). on which the human part of the community resides, whilst the lower is given up to the horse and other domesticated quadrupeds and bipeds. The last is entered by a small aperture at one side, to pass through which one is obliged to go on all-fours. After the family with their small stock is within, it is closed securely from the interior.

rence in the crowded towns of the plains. The mortality amongst the females is very considerably less than amongst the males, and again, that of the females of the mountain than that of those of the plains. This last also holds true in reference to the males, and that too considered apart from the great number who are continually falling in their feuds or civil wars, of the number of which it is beyond the pale of possibility to ascertain or attain to the slightest approximation. By reference to Table C. App. 2, we find that the aggregate gives a life of thirty-eight years and some months to each individual in the mountain town to which it refers.

We have much to regret that, from the very disturbed state of the country, from the want not only of proper establishments, but of proper officers to conduct those establishments, it was found impossible to obtain correct statistical tables to substantiate all the opinions advanced. By reference to table (6), an idea may be formed of the monthly mortality of a town in the centre of Lebanon, whose population was then estimated at 4500 souls for two years; presenting at the same time the ages and diseases, it was kindly permitted to be extracted from the books of the Reïss of the Maronite convent there, and which, we were assured, may be taken as a very good estimate of the average mortality of Lebanon. That in the plains is very much greater. A partial table of the last is appended also. Again, whilst plague and other epidemics prevail, we find the inhabitants of the plain fall before it, and in numbers far superior to those of the mountains.

The births in the town referred to above, for two years and nine months were 244, as stated before this information was obtained from the Reïss of the convent there (principal) who, along with all the others, is obliged annually to transmit to the patriarch a correct list of the births, deaths, marriages, &c. taking place in their districts.

The water, save along the coast, where it is frequently brackish, is generally good, but in some districts very scarce. In some parts of the mountains it is conducted in aqueducts from great distances, a considerable quantity being required for the irrigation, which is every where pursued to a very great extent there and in the plains. In the latter parts of summer and autumn it becomes very scarce, offensive, and in many cases unable to be drank, and is obliged to be transported from a considerable distance inland, when, in the neighbourhood of large towns, they have large tanks, &c., which, besides having springs communicating with them, receive large supplies during the rainy season. At Joppa it is strongly impregnated with nitre, and exerts a powerful influence on the kidneys. Thermal mineral springs exist near lake Tiberias. They are looked upon as very beneficial, and are much used by the inhabitants. Ibrahim Pacha, during his sway in the country, built handsome

bath-houses over them. One was exclusively set apart for his Highness's ablutions.

§. IV. Having given a very brief outline of the features of the country and its people, we now turn to the more immediate object of the Treatise, the diseases of the country, and we find, that, like all other countries, we have *first*, those diseases, which although becoming aggravated and more severe by reason of complications, at particular seasons, always exist; *secondly*, those which recur at certain seasons, and are incidental to it and other countries under the same latitude and temperature; *thirdly*, those which are peculiar to it, and a few countries very adjacent, and which do not exist in countries under the same latitude or temperature; and *fourthly*, those which are peculiar to certain districts, and are not known to exist elsewhere.

Under the first we would include all those ordinary affections incidental to a country, arising from its particular location, changes or alternations of temperature, or from the peculiar habits or irregularities of the people, and which we find in a greater degree wherever individuals congregate, or becoming huddled together, suffer from the demoralizing causes incidental. Under this class we would include ephemeral, simple continued, and intermittent fever, with all the smaller ills that life is heir to. Under the second we would take the inflammatory and typhoid affections of winter; the bilious, remittent, and exanthematous fevers of the spring and autumn; the nervous fever, diarrhœa, dysenteric affections, cholera, biliary derangements, *coups de soleil*, ophthalmias, and other affections incidental to the high temperature of an eastern summer, and which we find in other countries suffering under a similar temperature, or lying in the same latitude, and although all differing a little according to peculiarities of location, &c. yet have the same general type, &c. Under the third we would place that disease which we find only existing in, or peculiar to, certain countries; and although at a time extending beyond the boundaries within which it generally holds its reign, yet claims them as the place of its birth and residence. We refer to the plague. Under the fourth or last we would place those affections peculiar to certain districts only: the *bouton d'Aleppe*; the peculiar cutaneous affections of some of the mountainous districts; the ulcerating elephantiasis and leprous affections found to exist to the southward, more especially in the districts around Jerusalem. In addition, although we give the above as the general diseases of a country as a whole, yet, when we have so many climates depending on the different degrees of elevation, we must not only expect to find the diseases assuming different degrees of severity or mildness, altering their character entirely, but diseases entirely different, or, comparatively speaking, unknown in the plains as occurring in the

higher regions; we would merely enumerate bronchitic and pleuritic affections, with inflammatory fevers and prolonged typhus, which are, we might say, scarcely known in the plains, save in the most northern latitude of the country. Phthisis is abundantly prevalent in several districts, but more particularly about Aleppo; scrofula and goitre are very rarely observed anywhere; calculus is not frequent, but when in districts it does occur, it is then found to affect numbers; for instance, in the district surrounding Deir-el-khammar, Clot Bey, Physician to Mehemet Ali Pacha, is represented to have operated upon upwards of 25 in a very short period. Some of the calculi removed were of a very large size.

Although the above division has been made, it is not our desire to convey to the mind the impression or conviction that the diseases enumerated exist or occur solely at the periods mentioned; but to endeavour to give at one glance an idea of the diseases that are more particularly prevalent, and, therefore, more to be dreaded at their particular seasons; or, in other words, to endeavour to form some classification of the diseases of a country which are as yet imperfectly known; with the faint hope that it perchance may form a link in the great chain of medical investigation, which may be either rejected as unfit for supporting so important a fabric, or become remodelled and strengthened by the more able workmanship, or more extended opportunities, of some more gifted individual.

Independent of those already mentioned, we would take notice of some few others which cannot rightly be classed under any of the foregoing. *Hernia*, of various kinds and sizes, to be referred to the lax habits of body resulting from their dress and modes of life. Strangulation is very rare; but an interesting and rather unique case, which came under my observation, we have related in Part II. They generally use a very rudely constructed truss, which they procure from Constantinople.

*Venereal Disease.**—Both syphilis and gonorrhœa exist in the country. They both are severe, but if taken early, are found to be very tractable. The former frequently, if not always, assumes the sloughing form. They are said to have been introduced by Ibrahim Pacha's army,—at least in the mountain districts.

Worms are very frequent, and often, by their presence, produce unpleasant complications during diseases, or give rise to an irritative fever resembling the intermittent, for which last it is often mistaken, and all efforts to combat it previous to their expulsion prove equally unsuccessful. The *tænia* and *Ascaris lumbricoides* are most common amongst adults; the former again being the more frequent; some attain a great size.†

* These diseases are very rarely met with in the Turkish part of the community, whilst they are frequent amongst the Christians; but this does not arise from a superior chastity, but from a want of that liberty which the latter possess of roaming about, and a very good example set by their fathers confessors.

† Appendix, 6. (8.)

The largest brought away by the author was 11 feet 3 inches in length by measurement, after having been for twenty-four hours immersed in alcohol. In one case of bilious remittent fever, in which, for three days, there existed great irritability of the stomach, preventing the swallowing of the smallest quantity of fluid or solid, the vomiting of a lumbricus $11\frac{1}{2}$ inches in length accounted for this distressing symptom, which did not afterwards recur.

Barrenness, if it may be classed with diseases, is of very frequent occurrence, and in some districts prevails to a very great extent. It frequently leads to divorce.

Many chronic affections also everywhere exist ; but even to enumerate them would be as unprofitable as endless. By reference to Table A, App. 2, which is compiled from a table of chronic cases treated in a dispensary for a few weeks, opened in 1841, during the author's residence in Deir-el-khammar, for the purpose more immediately of attending the unfortunate individuals wounded there and at Bahklen, in the conflict of September of that year, some faint idea may be formed of them.

As regards the British troops, they suffered severely during the early part of the campaign, many falling victims in September and October at Djouni Bairout, and Sidon, to bilious remittents, diarrhoea, and dysentery ; and in November, December, and January at St Jean d'Acre, to a slow fever, which is treated of under the head of the "ataxoid remittent ;" and again, in July 1841, after having been exposed under canvass to a temperature rarely below 96° at midnight, whilst encamped on Mount Carmel ; but, from the great irregularity of the first part of the service, the frequent re-embarkation and disembarkation of the marines, &c., and the ill health of many of the medical officers, no tables pretending at all to accuracy can be procured, or any approximation given as to the number landed, dying, invalided, then or subsequently, or falling victims to diseases which had been either contracted in the country, or were consequent on their residence there.

Table A, App 3, presents an account of cases occurring in the Staff and British detachments of Royal Artillery and Sappers and Miners, &c. from November 1840 to August 1841. After a short period they seemed to have become inured to the climate, and may be stated to have been generally healthy, which must, in a very great measure, be attributed to the unceasing care and attention exhibited by the officers commanding the detachments, to the comfort and regularity of the men, and to the ready co-operation which they ever yielded to the judicious arrangements recommended by Deputy Inspector General Robertson from time to time, but more especially during the four months in which we were residents amongst the plague. If we look to a question which naturally arises, were the English soldiers greater victims to disease and to the climate than the Turks ? the author feels himself, from personal obser-

vation, justified in stating, that the English troops suffered, on the whole, much less than the Turkish; and that although the diseases were much more severe in the former, they were attended with much less mortality.

§. V. The medical resources of the country, we find most advantageous to divide into three heads: 1st, their hospitals; 2^d, their medical men; 3^d, the remedies derived from the country, and made use of by the native haykims.

In relation to the first, or hospitals, this extensive country boasts not of one civil hospital, dispensary, or other establishment for the relief of the thousands of distressed indigents which swarm the country from north to south. As to the military, they can scarcely be said to have been very much better supplied; for although they have apartments or houses set apart for the reception of the sick, yet it was not till before we were about to leave the country, that the slightest approximation to anything like order or arrangement was observed. At first they were not only filthy, but truly disgusting, and could not come under the appellation of hospitals. With much more propriety might they be termed dens of filth and centres of disease; which will not excite surprise when we are told that their medical officers require no qualifications to entitle them to hold their appointment. As a few observations may not be altogether uninteresting, a copy of a report, compiled from an attendance of six weeks on the central one at Bairout, in September and October 1841, will be found in Appendix 8.* They are very barely supplied with medicines, &c. The experience of others, even of their own officers (Appendix 7 and 8) fully testify to the fact of their hospitals in other parts of the country being in a state even more deplorable than that of Bairout. But when making this sweeping assertion, we feel ourselves compelled to stop for a moment to pay a tribute to the memory of one British surgeon, Mr Maunson, who, having entered the Turkish service, fell a victim to his zeal and over-exertion, whilst endeavouring to contend against impossibilities. At Jaffa, his hospital, considering all the difficulties against which he had to contend, was represented by several English officers, who visited it shortly before his death, to have done him ample credit. We have to lament that Ibrahim Pacha had been compelled to abandon the country before he had carried into effect all his contemplated improvements. Hospitals had been commenced in various parts of the country, which, judging from what had already been effected, would, when completed, have done justice to any portion of civilized Europe. There had been commenced, one at Aleppo, a second at Damascus,† and a third at

* This report was addressed to Deputy-Inspector-General Robertson.

† Dr Robertson, in a letter to us, states, after visiting the hospitals at Damascus, "there are four hundred in hospital, and I find no reason to alter the reports I have
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Mesjdel; this last the author had an opportunity of visiting in February 1841. In it, vast excavations had been formed for having a continual supply of water, and the ground floor, which, extending over a considerable space, had already been laid down, demonstrated sufficiently that not a stone had been placed without mature deliberation.

Although we may feel a little surprise to learn that no medical relief is afforded by this vast country to its many indigent sufferers, it will not be lessened when we are informed that, although there be various consuls resident at Bairout; many English and other merchants, constituting a considerable large society; that there are many vessels daily arriving and departing; that sometimes every man on board is laid prostrate with fever;* yet they have not even a small hospital to receive them, or a regular medical man, as at Smyrna, to attend them; but they are either huddled off to the lazaretto, to which, under some circumstances, certain death would even be preferable, or have their lives confided, in many instances, to *soi-disant* medical men, who might more appropriately be designated "self-constituted murderers;" but this is encroaching on the next department, or that which refers to the medical men.

§. VI. Few truly deserving an approximation to that appellation are to be found in the country. As far as the author's information went, he believes he states the whole when he mentions one at Aleppo; one attached to the quarantine or military at Tripoli; one attached to the military at Damascus; one ditto at Sidon; and three attached to the quarantine establishment at Bairout. They are all foreigners, educated under the Maltese, French, or Italian schools; and, save in one or two instances, had been attached previously to the army of His Highness Ibrahim Pacha, but had either resigned, or remained, when their master was forced to quit the country he had wrested from the hands of its lawful lord. There are many others, as we termed them before, "self-constituted murderers," and *soi-disant* native doctors, (generally called haykims.) The last pretend to have the knowledge of diseases, &c. handed down to them from their ancestors, and affirm that they are in the possession of ancient Egyptian works, which were repeatedly promised to be produced; but in this, as in all other circumstances, their promises were liberally made, but made only to be broken. As far as regards their treatment of the more simple ailments, they do very well; for, pretending to more depth than science, they follow very simple means, and if they

already made, as to the total insufficiency of the medical officers of the Turkish army;" and he moreover adds, "the system of the poor wretches is bad beyond description." September 1841.

* In the case of the "Black Eyed Susan" brig, there was only one boy left out of a crew of seven men; they were under our care. The mate and two of the crew died.

effect not good, in the generality of instances do no great harm. In the more severe cases they bleed very profusely, and make use of remedies which will be taken notice of immediately; and if the disorder go beyond their skill, and no European medical man be within their power, they resign the poor sufferer to his fate, after exerting all their skill in vain, which, in the generality of cases, is only attended with the producing of pure exhaustion from over-depletion. The Syrian barbers, everywhere met with, do all their duties remarkably well; shave nicely, bleed neatly, apply leeches very quickly, and perform other small surgical duties at very low prices. They are employed to perform these services by the haykims, or physicians, who, swollen with vanity and conceit, look upon themselves as a class vastly superior, and of no small importance to the community at large.

In the neighbourhood of Bairout, there is resident a medical practitioner of the name of Dr Van Dyck, who is attached to the American mission.* Of this gentleman's professional assiduity, and attention to the wants and distresses of numerous applicants, and of those of his brother missionaries, whose hands are ever ready to assist the poor, and relieve the distresses of the suffering indigent, words are inadequate sufficiently to speak. We believe that an association,—the “Syrian Medical Aid Association,” has lately been formed for the purpose of sending out medical men to afford gratuitous advice to the thousands of poor residents in and around Bairout, and ultimately to exert their labours in a more extended field of misery and disease; and that this beneficent society have in contemplation the establishment of a large hospital there. This truly charitable and disinterested arrangement has been carried into effect by a native of the name of Apaad Kayat, who, having come over to this country some years ago, and after having been kept at one of the English universities for

* The American mission has for many years existed in Syria. The members composing it, of which there were, one at Aleppo, five at Bairout, and two at Jerusalem, are men who add, to their high respectability and excellent qualifications, a most gentlemanly deportment, and much to be admired line of conduct, not always met with in those from our own country. They look for a higher reward than this world can bestow; suffice it to say, devoted to the cause in which they have been called on to embark, and indefatigable in their exertions; they persevere in the works of education and regeneration, in defiance of threats, denunciations, &c. They have a very large establishment at Bairout, in which upwards of thirty boys and girls are always boarded, clothed, and educated gratuitously, in addition to daily scholars. Attached to it is an Arabic press. The boys and girls educated at this establishment speak the English with great correctness and precision.

They have Divine service on Sabbath; in the forenoon, in English at the house of the American Consul; in the afternoon in Arabic, in the church attached to one of their houses. Many have become converts. The whole body is much looked up to, and highly respected, and justly so by all classes, save the Maronite Patriarch, and a few of his immediate associates.

During the summer, they retire to the mountains of Lebanon, and open schools, which are well attended, and much prized by the inhabitants, who, during our intercourse with them, expressed always a great desire to be educated, more especially the Druse population.

upwards of two years, returned to his native land, intrusted with a mission, and endowed with a handsome salary. The principal objects of the mission were ;—the establishing of schools, and the raising of the females of that country from their state of total ignorance, and servile submission, to a state of enlightenment, and to be fit associates for the men. How far he had fulfilled the objects contemplated during our thirteen months' residence in the country has already been fully discussed before many of the committee, by various British officers who were there employed, on their return to this country, and how it will ultimately succeed, time only can show. We wish not to throw out reflections upon the individual mentioned above ; but we regret that so important a mission has not been entrusted to an Englishman, who, like the respectable American missionary there resident, would command respect and admiration,—two things essentially necessary to be possessed before we can hope to hear of much success attending any endeavours amongst such a race of men.

§. VII. The medical remedies derived from the country, and used by the native haykims, are very few indeed. In some places in the mountain districts which we visited, we found them totally ignorant of all save Rose leaves,* of which they make an infusion, subsequently a syrup, and these conjoined with enemata, bleeding, and irritants, to be hereafter mentioned, were the sole remedial agents in their hands. In other districts again, we find them in possession of some few more. The infusion of the flowers of the Violet (*Zahir miniphsuda*) ; of Chamomile (*Zahir babournish*), are given freely to produce diaphoresis. The flowers of *Sambucus niger* (*Beil lassan*), and the root of *Malva sylvestris* (*Zahir ilkhahēsi*) are used as expectorants. The flowers of the last named are used as a cataplasm, and are considered to be endowed with peculiar and very beneficial properties. The leaves of the *Centaurea benedicta* (*ontaryoun*), of the coralline (*Haxishit el hanash*), and of the salix (*sairon*), for intermittents. The natives affirm that the exhibition of these last is attended with great success. They give the preference, however, to the salix. Other remedies are in the possession of crafty females, who pretend to have the power of expelling the fœtus. The author has frequently been consulted on this very point, and the remedy advised to be taken has been shown to him. It has a very bitter and repulsive taste. In one case in which it had been exhibited, it was followed by a severe attack of metritis,† but failed in producing the desired effect. In the above we have not taken any notice of the actual medicinal plants, &c. the produce of the country, but only those which were known to the native haykims in the dis-

* Majour-lootird.

† The individual has since been delivered of a still-born child, at the full time.

stricts we visited. My opportunities and time did not afford that scope which I could have desired.

Local bleeding, which is had recourse to in many affections, is performed by the application of leeches, or by incisions made in the inner part of the thigh or leg, or on the soles of the feet, by means of a razor. The latter are principally used in affections of the head in children, and are attended with considerable advantage. We have seen as many as three or four dozen made in a child of four years old who had become comatose. Immediately thereafter, and from time to time subsequently, they took the helpless sufferer in their arms,—shook it several times, and threw it about for the purpose of endeavouring to rouse it. We need scarcely add, that the child died, independent of being “well shaken.” It is very fortunate that leeches, in the use of which they place so much confidence, are in such abundance, and at so very moderate a charge. The only drawback is, that they are in the habit of either “letting the leeches out,” or taking them back at half-price.

Counter-irritation is practised in all pains, either of the inflammatory or rheumatic character; in the former it is preceded by bleeding. The following are the means employed;—the actual cautery, at various degrees of heat; heated charcoal in one or two points, or even made to form a complete circle round the extremities in affections of the joints; the eschars thus made being kept open subsequently by the oft-renewed application of green leaves; or, by taking a portion of rag or paper, and, setting fire to it, keep it in its position by placing a jug or glass partially over it. This last is only used in extensive pleuritic pains, (da il jump.)

In the principal towns laboratories exist, and the more intelligent of the haykims use some of our simple remedies. Two exist at Bairaout, independent of the drug-shops of the natives in the bazaars; one, kept by Crolla and Laurella, is handsomely fitted up, well-stocked with medicines of good quality imported from Marseilles, and for which a moderate charge is made.

The accouchements are performed by the females, who observe a number of very ridiculous forms on the completion of that ceremony, which takes off the reproach of the woman from amongst her own sex.

As regards their surgical practice, it is of a very primitive kind, and is principally performed by “surgeon-barbers,” who are employed, as already mentioned, by the haykims, for the purpose of bleeding, shaving, and applying leeches; which last they do most dexterously. For their ulcers, &c., they make use of certain greasy applications, which they compound, and the composition of which they keep a profound secret. In callous or indolent ulcers, they excite action by making incisions around or through the callous borders. In

gun-shot wounds, they have a very great dread of the poisonous nature of the ball, &c., and always express great anxiety to have it removed at all risks. When not very deep they make an incision over it, and extract it. If it be beyond their reach it is allowed to remain; a circumstance always productive of great subsequent mental uneasiness. In perforating wounds by means of a small portion of finely smoothed wood, they push through cotton wick, which is permitted to remain till they consider all impurities to be expelled. In other wounds, they introduce portions of charpie, which are daily extracted and replaced. Many deformities from gun-shot wounds are to be continually met with amongst the mountaineers.

They are very unwilling to submit to any, even the slightest operation, saying that they will rather take their chance and die; but none of the native surgeons, as far as inquiry went, were ever known to attempt an operation, however simple. Amongst the Turks no operation approaching to the dismembering or disfigurement of a joint or portion of the body is permitted during the time of peace, the poor and infirm being left to his fate;* but they have the power of performing any one, if they have the means, during the time of war.

(To be continued.)

ART. II.—*The Condition of the Blood in the Veins in the natural and the disturbed states of the Animal System.*

By G. CALVERT HOLLAND, M. D., Physician to the Sheffield General Infirmary. (Continued from p. 127.)

INQUIRY II.—*An examination of the experiments of Physiologists, supposed to establish the direct influence of the heart on the motion of Venous Blood.*

VENOUS circulation has always been regarded by physiologists as an exceedingly difficult and abstruse question. The length of column to be moved, its distance from the propelling power, and the intervention of minute capillaries, are circumstances well calculated to give rise to various speculations. The column has not only these peculiar conditions, but exceeds by almost three times the arterial, which is imagined to urge it forward. Physiologists have endeavoured to discover forces adequate to the transmission of the blood through its long and complicated circle. Magendie finds them in the action of the heart and arteries. Barry, in addition to these, in the diminution of pressure in the chest on inspiration. Others regard the heart, arteries, and capillaries, conjointly, as the efficient causes. It is laid down by Arnott, that the weight of a column of blood, in any descending artery, is capable of raising a mass to an equal height in the corresponding vein.

* Appendix 8, Report on Turkish Hospitals.

We have examined at great length the experiments of Magendie, and have shown that they are liable to serious objections. They do not establish the direct and uninterrupted influence of the heart on the venous column. According to his own statement, blood flows from a punctured vein some time after the *vis-a-tergo* is wholly arrested, and, indeed, only ceases when there is no blood in the capillaries and artery to afford a continued supply. His experiments are defective and inconclusive; they have been deemed, however, by physiologists as ingenious in conception and accurate in result; and no one has presumed to question them. In his extended series of experimental researches to determine the influence of the heart and arteries, the whole of the sanguiferous system was disturbed, and no just inferences respecting these, or any other powers, could consequently be deduced from them. His numerous and elaborate experiments on venous circulation, in particular, are open to formidable objections. Before proceeding to the consideration of them, we shall offer a few remarks on the views of Arnott. There is no one whose opinion is entitled to greater weight.

Errors in physiology are to be traced to two very different classes of writers. The one in the study of the animal machine, does not sufficiently value the light of physical science reflected on his inquiries. The other will not acknowledge the peculiarity of vital phenomena, and their modifying influence on all the important processes of life; but is constantly endeavouring to reduce them to the familiar laws of inorganic matter. Both tendencies are unquestionably injurious.

According to this eminent writer, the simple weight of a column of blood, in any descending artery, will raise the contents of a corresponding vein to an equal height. This would certainly be the case, were the vessels connecting the two open and presenting no obstacles. The capillaries are intermediate, of which little is known either of their structure or function. In them are carried on all the complicated and mysterious operations of life, but how or by what means can only be conjectured. The description which is given by capillary circulation by various writers would scarcely lead us to suppose, that it depends wholly on a *vis-a-tergo*. No continued or regular progressive stream is observed extending from the artery to the vein. The connection between them is maintained by globules moving alone, in pairs, or sometimes three abreast, which are described as flowing with great irregularity; at one time at rest; at another urged forward with a momentary accelerated force; and then, perhaps, returning upon their previous steps. Such is the picture of capillary circulation, furnished by the microscope in the hands of Magendie. These globules, according to this physiologist, are the carriers of the impulse of the

heart, and yet their motion is marked by the greatest possible irregularity. If these exhibit such phenomena, in what condition are these in still smaller vessels on which the microscope throws no light, being, indeed, too minute to admit of accurate examination, and yet the important operations of life are, in all probability, carried on in vessels of this character?

The blood, which is one moment in the aorta, is not immediately conveyed into the *vena cava*. The properties of the fluid contained in each are widely different; and where the change takes place, or what is the nature of it, is involved in doubt. The blood both loses and acquires something at every revolution. The loss, as well as the gain, is the consequence of vital action. The interchange of globules occurs perhaps in the exceedingly minute capillaries, to which the influence of the heart cannot extend. Physical science can present no objects analogous to these vessels, nor can it determine either their nature or functions.

The capillaries have frequently been examined; the animal, however, selected for experiment, has either been tortured, or the organ placed in the field of the microscope has been so constrained or injured by its position, or other causes, that the phenomena observed could be no just indications of capillary circulation in a normal state. In illustration of the truth of this remark, we solicit attention to the following experiment.

"The crural artery and vein of a frog being insulated by careful dissection, after a tight ligature has been passed round the leg, the circulation in the foot is continued only by these vessels. The animal is pinned on a layer of cork, so that the interdigital spaces shall suit the object-glass of the microscope. The progress of the blood in the capillaries is then examined. When the degree of rapidity of the globules is ascertained, the course of the blood in the artery is interrupted, while the vein is left free. The globules still continue to move, but more slowly. The motion becomes slower and slower, and entirely ceases at the end of two or three minutes. Let the pressure be withdrawn, and instantly each globule which was in a state of complete repose shoots forth like an arrow, and resumes its normal rapidity."*

This experiment may be adduced with much greater force to prove the independence of capillary circulation on the heart than the contrary, which it is imagined to establish. The web of the foot has no connection with the general sanguiferous system, except by means of two vessels, an artery and a vein, and therefore, by compressing either, it is easy to influence the circulation in it. The experiment is supposed to prove that this depends altogether on the impulse of the heart. What are the results? When the blood in the artery is arrested, it is evident that none can flow to-

* Opus cit. Vol. iii. p. 269.

wards the web, except that which is contained within the point of compression.

The circulation in the web does not immediately cease on intercepting the *vis-a-tergo*, but, on the contrary, continues several minutes, and ceases only when the artery fails to furnish the necessary supply of blood. He indeed, remarks, "The globules continue to be moved, but more slowly. This motion becomes slower and slower and ceases entirely after two or three minutes." The circulation was observed for about three minutes after the interruption to the flow of arterial fluid. It gradually became feeble, until at length it stopped,—effects which might have been anticipated independently of the intercepted impulse of the heart. In the experiment the supply of blood to the web is cut off, so that the capillaries can receive only what is contained from the point of the compressed artery. They urge forward the blood as long as any is transmitted to them, and only cease to exercise their functions when the current fails. Here is a close relation between cause and effect. Magendie calculates on the capillaries continuing in operation when destitute of the ordinary stimulus, for when they have exhausted the little he leaves them, he points to the results as proving that they cannot act without the co-operation of the heart, though he admits the continuance of circulation without such aid for about three minutes. It is difficult to imagine how this acute physiologist could fail to perceive the defects of the experiment, for it may, as already stated, be adduced as proving that capillary circulation is independent of the direct impulse of the heart. It is not necessary to allude to other experiments on the same subject. They are all open to the same or similar objections.

The consideration of these facts and of others much less equivocal, force upon the mind the conviction, that the capillaries are a system of vessels through which the influence of the heart is not transmitted in the undisturbed conditions of the animal system.

An objection to the veins receiving the direct impulse of the heart, is derived from considering their condition. Had they the relation to this organ which is insisted upon by Magendie and modern physiologists, would they not be equally distended with the arteries? If the blood flowed directly from one to the other, an important difference in the physical condition of them would scarcely be imagined. The difference, however, is great, and acknowledged by all writers. It is remarked by Dr Carson, that the veins "in their ordinary state, are not in the situation of rigid tubes, which they must be admitted to be, upon the supposition of the whole blood being advanced through them by a force impressed upon this fluid at their distant terminations." Magendie also states, "*Les parois artérielles sont toujours distendues par le*

sang, les parois veineuses sont souvent affaissées sur elles memes.” The difference is admitted by Arnott, and he attempts to explain it in the following manner:—“The venous current is treated of as a very obscure subject; and some authors in their anxiety to explain it, have assigned causes for it, which, as will appear hereafter, are positive absurdities in physics. The difficulty in the question seems to have arisen from the great disparity observed between the tension in the arteries and in the veins, while the reflection did not occur, that it was owing to there being a free passage or outlet from the veins through the heart.”

This explanation cannot be deemed satisfactory. The cause assigned is insufficient to produce the difference in the tension of the two classes of vessels. Let us imagine the tension equal; the dilatation of the right auricle removes from the upper end of the venous column only about one ounce and a-half of blood. The difference, therefore, in the tension may be measured by the removal of this quantity of fluid. This certainly must be the measure of it. But this is inadequate to account for the marked disparity in the condition of arteries and veins; the cause, moreover, is not an uninterrupted action. If the dilatation of the auricle relieves the tension, this will necessarily return during its contraction, at which time the blood has no passage or outlet. If the dilatation of this cavity is indeed the cause of the difference; during its contraction the venous tension must be precisely the same as the arterial. The veins, however, are as flaccid in the one state of the auricle as in the other, except those in the immediate vicinity of the heart. The numerous and well-conducted experiments of Hales furnish us with exact data on the subject. The blood rose in a tube fixed to the jugular vein of a sheep, five inches and a-half; in the carotid artery of the same, six feet five inches and a-half. There was a similar difference in all his experiments. The rise of the fluid in both vessels always varied with the muscular efforts or the straining exertions of the animal.

The argument of Arnott is, that the pressure of a column of blood, in a descending artery, will raise the blood in a corresponding vein to an equal height. In advocating this doctrine, he evidently regards the intermediate capillary vessels, connecting the two, as offering no obstacles to the free transmission of the arterial current. In our previous labours we have shown that the globules are not marked by a regularly progressive movement, indicating a steadily sustained pressure *a-tergo*. The contemplation of the phenomena of capillary circulation would scarcely lead to the conclusion, that these globules, either singly or in pairs, are the carriers of a pressure of 60 pounds; and that, were it not for the alternate dilatation of the right auricle, the veins would indicate this amount. If such dilatation be the cause of the differ-

ence we should naturally expect that when the artery and vein were placed under similar circumstances, the results would be analogous. To accomplish this it is only necessary to give to the contents of both artery and vein a free exit. If the escape of venous blood into the right auricle be the cause of the disparity between arterial and venous tension, provided the contents of these vessels have the same facilities to escape, it matters not whether within or without the body, the tension ought to be the same. The cause is stated to be one and the same, the contraction of the left ventricle. According to the views of Arnott, the venous column is simply the continuation of the arterial, and differs only in being a little further removed from the propelling power; therefore, if a vein and artery be divided or punctured, the contents of each being precisely in the same circumstances, would not the same degree of tension be produced? It is unnecessary to remark that the greatest possible disparity exists. The blood of the one is scarcely at all projected, whilst the other is emitted with great force, and continues to flow long after the cessation of the venous current. The blood ejected by an artery requires considerable force to arrest it, that of the vein is readily suppressed, and the current, while it continues to escape, is not in any degree modified by the successive dilatations of the right auricle.

It is important to bear in mind that the reasoning of Arnott rests principally on the experiments of Magendie. In entering upon the subject he remarks, "1. Magendie laid bare the chief artery and vein of a living limb, and lifted them at the part, so that he could make a tight bandage round the limb without including them; it was then found that the flux of blood from a puncture made below a ligature on the vein was rapid or slow, according as the heart was allowed to produce a greater or less degree of tension in the artery; this tension was regulated by compressing the artery between the fingers. 2. After a similar preparation of the parts, it is found that the blood will ascend in a tube from the obstructed vein as high as from the artery. 3. In the common operation of bleeding, when the vein is first punctured, the blood jets from it, as from an artery.

In previous investigations we have exposed the sources of fallacy in these experiments, and have shown that they throw no light whatever on the laws regulating venous circulation. They entirely subvert the ordinary conditions of the arteries, the capillaries and the veins; hence the results are calculated only to mislead the inquirer. They mystify and perplex what they propose to elucidate.

This enlightened philosopher remarks, "after a similar preparation of the parts, it is found that the blood will ascend in a tube from the obstructed vein as high as from the artery." In the ex-

periments of Hales, when glass tubes were fixed to the jugular vein and carotid artery of a sheep, the blood from the former rose only five inches and a-half; while that from the latter rose six feet five inches and a-half. In similar experiments on a horse, the blood from the jugular vein ascended in the tube, "in three or four seconds of time, about a foot, and then was stationary for two or three seconds; then, in three or four seconds more, it rose sometimes gradually, and sometimes with an unequally accelerated motion, nine inches more, and when the animal strained or struggled strongly, the blood rose to the top of the tube, which was four feet two inches long; but in that fixed to the carotid artery, it rose nine feet six inches. *

In these cases, the contents of the artery and vein have the same facilities of escape, and yet how widely different is the degree of tension indicated. In the experiment alluded to by Arnott, in which the tube is fixed to the obstructed vein, the blood is said to rise as high as from the artery.

It is scarcely possible to find, in the whole range of physiological investigations, an experiment that more completely destroys the natural relations of the arteries, capillaries, and veins, than the second experiment adverted to by Arnott. The object of it is to ascertain whether venous circulation depends on the heart, or on any intermediate cause. The first step in the experiment is to confine the circulation of the limb to two vessels, an artery and a vein, and the connecting capillaries, so that the arterial current, urged forward by the impulse of the left ventricle, has only one mode of escape,—through the tube fixed to the vein, and, under such circumstances, it will necessarily ascend in it, as high as from the artery.

If the connection between the artery and vein be direct, and the sphere of circulation in a limb be narrowed to these two and the intermediate capillaries; in the experiment, from the point of the artery laid bare, to the obstructed vein will be one series of distended vessels; nor will the blood flow into the tube until such effect be produced. The distension of the vessels, as if inert in structure, is an inevitable consequence; and the value of the experiment consists simply in proving that the impulse of the heart in this peculiar condition of the vessels, is capable of being transmitted to the column of venous blood. It does not, however, in any degree show either the influence of the capillaries, or of causes which are imagined to act in advance of the venous current, and with what force of reasoning can it be adduced in explanation of the phenomena of circulation?

The manner in which the blood flows into the tube is not analogous to the motion of it in the veins, and the extraordinary dis-

* Statical Essays, by Stephen Hales, D.D., F. R. S., Vol. ii. p. 13, 4, 5.

parity in its conditions has awakened no suspicion of the correctness of the experiment. The obvious effect has satisfied the inquirer, and even one eminently familiar with the principles of physical science.

The blood which flows in venesection indicates no great tension in the veins. On first making the incision, it is usually projected several feet, but it instantaneously subsides, rising perhaps a few inches, and often only trickles down the arm. The stream exhibits no jerks synchronous with the contractions of the left ventricle. The projection of blood on puncturing the vein is no criterion of the force employed in venous circulation. The application of a bandage to the arm previous to the operation produces, of course, distension in the superficial veins, so that the energy with which the blood escapes is the measure of accumulated pressure, and not of the degree with which it is urged forward under ordinary circumstances; the fact, however, is adduced by Arnott as displaying the great tension of the venous system. It is an unnatural effect, originating in a disturbed condition of the circulation.

The two systems have different degrees of tension. That of the arterial is derived entirely from the heart; the venous, chiefly from the capillaries. It is modified in both, in all muscular exertions; hence there is a primary and a secondary cause operating in both systems. Exercise facilitates the flow of arterial and venous blood; the degree of acceleration varies greatly in different portions of each system. The circulation in those parts of the body the most directly brought into play, will be the most invigorated; those less affected in an inferior degree. The extensibility of arteries and veins will readily admit of such irregularity. The manner in which the blood is influenced in both vessels by bodily exertion is shown by the experiments of Hales and Poiseuille. The blood which is allowed to escape on these occasions relieves at once the tension; but in the ordinary conditions of exercise, the sudden and partial tension of each system requires time for its equalization. Accordingly, a stock of motive power is gained by both, and co-operates with the primary causes in exciting and maintaining a vigorous circulation. Were the vessels full to distension, these temporary effects could not possibly occur. It is also evident that the tension of both systems is exceedingly variable, not only generally but locally. The arterial is relieved by the fluid being urged into the capillaries; the venous, by its transmission into the blood, and, perhaps at times, by its accumulation in the *vena cava*, which is capable of receiving an immense quantity.

Were the tension of the venous system occasioned by the heart the prevailing doctrine, though less than that of the arterial, would it not be expected to be uniform? The causes imagined to produce it are general, consequently cannot exercise a partial influ-

ence. The crural vein ought to have the same tension as the jugular. If the simple weight of a column of arterial fluid can raise the contents of a corresponding vein to an equal elevation ; and if, indeed, a force of sixty-four pounds acts upon this column, is it possible to conceive that the veins can be partially affected ? The pressure operates in every direction, hence, on this supposition, the tension in all parts of the venous system must be uniform. The experiments of Magendie and Poesseuille prove, however, that this is not the case. A reference to their authority leads us at once to the analysis of their labours on venous circulation ; which are neither few nor unimportant. In previous investigations they had ascertained, by means of the hæmadynamometer, that the pressure in all arteries is the same, whatever be their distance from the heart. These experiments have been analyzed in the preceding pages at considerable length, and we have endeavoured to show that the instrument employed is inapplicable to determine the question. Admitting, however, the conclusion to which they lead, the tension in the venous system, though less than that of the arterial, would be expected to be alike throughout. If the pressure in the one system be uniform, the same causes being in operation in the other, varying degrees of tension, according to the situation of the vein, are results clearly inexplicable on the received doctrine. According to this, not only is there a *vis-a-tergo* of immense power, but indeed a force which continues undiminished in energy, even to the extreme arteries, urging the blood into the capillaries. Are not these conditions amply adequate to establish an equal tension in the veins ? Magendie and Poesseuille, nevertheless, prove, that such is not the case. The difference in the tension of the two systems, and the variety observed in the venous, are thus explained by them ; and to their remarks we solicit particular attention.

“ From the experiments which we made at last meeting, there results for you the knowledge of this important fact, that the pressure supported by the veins is greatly inferior to that supported by the arteries. In the one and in the other system of tubes, the heart is always the principle of movement, which without it could not exist. Why, then, are not the hydrodynamic phenomena in all respects identical ? That depends on a number of circumstances, of which several are already known to you, and the others shall be successively pointed out as we proceed in these inquiries. The arterial circulation claims to be treated by us, in the first place, as presiding over the progress of fluids in the other points of the vascular circle ; and, commencing with it, we shall proceed, so to say, from the known to the unknown. Before going farther, we shall mention in a word the tubes which the venous blood traverses, in order to return to the pump. And, in the *first* place,

if you cast a glance over the general disposition of the sanguineous canals, you will be struck with the difference in these two grand systems, presented by their mode of anastomosis and distribution. While the blood is projected by the heart in canals decreasing in dimension, it returns to this organ by canals constantly increasing in diameter. It is impossible that the passage of fluid columns, in spaces straiter or more ample, shall neither augment nor diminish the rapidity of the current. In the arteries it is at their origin, in the veins at their termination, that the current is more rapid.

“ The arterial parietes are always distended by the blood ; the venous parietes are often collapsed upon themselves. The former, being thick and resistant, unceasingly react upon the liquid column : the latter, thin and flaccid, enjoy but a feeble degree of elastic spring. In these you will meet with numerous valves, destined to oppose a reflux of the currents in certain directions, while those present not the least vestige of such a structure in their whole course. There is a uniformity of pressure throughout the general arterial system ; but a very great variety of pressure in different portions of the venous system : in each system respectively, the fluid, endowed with very different physical properties, moves very differently : in the one there is a rapid, in the other a sluggish motion of the sanguineous column. When you open an artery, the stream escapes by a succession of jets synchronous with the pulse ; on a vein being opened, the stream, if there is any, is feeble, and glides out with a uniform motion.

“ Above all, it is in the number and capacity of their tubes that these two departments of the vascular apparatus essentially differ from each other.”*

In this extract, there is no notice of the cause, which is regarded by Arnott as alone sufficient to explain the general disparity between the tension of the two systems, nor does the distinguished philosopher allude to the labours of these physiologists on this interesting branch of inquiry. His views would scarcely lead him to imagine, that every part of the venous system had different degrees of tension springing out of the uniform pressure of the arterial system. None of the conditions stated will explain the results at which these physiologists experimentally arrive, the general accuracy of which it is not intended to call in question. We admit a disparity in the tension of the two systems, and contend that it is not explicable on received views.

We proceed now to the analysis of the causes adduced by Magendie as accounting, not only for this difference of tension, but

* *Lçons sur les phénomenes physiques de la vie.* Par M. Magendie. Tome iii. p. 148.

for the variety observed in the venous system ; which causes may be conveniently arranged under eight heads :—

1. The heart is alluded to, as urging the blood forward at a great rate in the arterial system, from acting on the column in immediate contact with it.

The velocity* of circulation is no part of our inquiry, but simply the tension in the two systems. Magendie and Poiseuille inferred, from experiments on arterial circulation, that though the blood became slower as it proceeded from the heart, the same pressure was manifested in an artery in the thigh, as in one in the vicinity of the left ventricle, and therefore the rate of motion is clearly no subject for consideration at this moment.

2. Arteries and veins differ greatly in their anastomoses and distribution.

This is admitted. The anastomoses of the veins exceed those of the arteries, and the number and capacity of the veins are also considerably greater ; but what relation have these circumstances to the present inquiry concerning tension ? If the blood, in one class of vessels, is an uninterrupted column extending to another, the pressure will be equally distributed. It is a principle in hydrostatics, that, “in a quantity of fluid submitted to compression, the effect is equally diffused throughout the whole, and similarly in all directions.” The increasing capacity of the arteries, from their frequent subdivisions, and the diminishing capacity of the veins, in their course towards the heart, will influence the rate of motion, but not the amount of pressure transmitted by the left ventricle.

3. The arterial fluid is rapid at its commencement, and the venous at its termination.

The disparity in the capacity of the two systems and their different relations to the central propelling power, explain these phenomena.

4. It is stated that the arteries are always distended, and the veins generally flaccid.

Does this show the equalization of pressure ?

5. The arteries react powerfully on their contents, the veins scarcely at all.

The motion of the blood will be modified by this circumstance, but the pressure permanently acting from behind will neither be increased nor diminished by it. The force of the heart, spent in dilating a contractile vessel, is said to be restored by its reaction. Had it neither this property nor dilatability, in place of the propulsive power being thus momentarily lost, the forward rush of the fluid

* In experiments, which we have previously analyzed, he had proved, that though the blood moved with different degrees of velocity in the arteries in all, whatever might be their size, it exhibited the same momentum.

would of course be greater. In a contractile vessel, the power is spent in two directions,—laterally and longitudinally; in one that is not contractile, in the latter direction only. If the venous system be full and directly connected with the arterial, the contents of the former will be urged forward by the pressure in the latter; if not full, and so connected, what is to prevent the blood from establishing an equal or uniform tension in the veins?

In reasoning on the views of Magendie and physiologists generally, the contractility of the arteries cannot be regarded as an important modifying condition. The impulse of the left ventricle is stated to be transmitted directly throughout the venous system; therefore, what is to prevent this impulse from establishing an equality of tension in both systems? The cause assigned is, that the vessels of the one are endowed with contractile properties, in virtue of which they re-act on their contents; while those of the other admit of great distension, and possess little contractility. The absurdity of this argument will appear, on a very slight consideration, keeping strictly in view the reiterated assertions of physiologists, viz. that the capillaries connecting the two systems perform no part in the process of circulation, being simply the carriers of the blood, and originating no motive power.

Supposing no obstructions to exist between the two systems, which, of course, is implied in the doctrines of these physiologists, the impulse of the left ventricle would inevitably establish an equality of tension in both. The blood would flow out of the one into the other, until such effect were produced, and then every successive contraction of the ventricle would maintain the same tension in both classes of vessels. The blood in the veins cannot possibly be propelled by this power, unless both vessels be in the same state.

The arterial column cannot push forward the venous without this necessarily causing distension in the vessels along which it flows, and this condition would be general and modified only by the quantities removed by the successive dilatations of the right auricle, but which quantities would make no difference in the rounded appearance of the veins. In the experiments of Magendie, in which he attempts to prove the direct influence of the heart on venous circulation, the blood does not escape from the vein exhibiting such influence, or in harmony with the arterial current, until it becomes thoroughly distended. The same occurs also in showing the direct connection between arteries and veins, by the injection of water in the dead body. No difference in the properties of the two classes of vessels can prevent the same result in the natural conditions of the animal system, reasoning on the doctrine that the influence of the left ventricle is transmitted directly to the venous column.

6. There are valves in the veins, and none in the arteries.

The valves are to prevent the retrograde motion of blood, and have no effect on its progression, or influence on the causes acting *a-tergo*, and consequently on this occasion merit no remarks.

7. The properties of the blood are different in the two systems.

They are much more stimulating in the one than in the other. This may cause a difference in the rate of circulation, but none in the tension of the vessels. The tension has a reference to the power which propels the fluid, and not to the quality of the latter.

8. There is a great difference in the capacity of the two systems.

The influence of this circumstance has already been considered.

Magendie, after enumerating the forgoing conditions, concludes as if the inference was unavoidable.

“There is a uniformity of pressure throughout the general arterial system; but a very great variety of pressure in different portions of the venous system.”

The inference does not flow from the facts stated. The cause of the various degrees of pressure in the venous system is altogether unexplained, on the consideration of which we shall enter. Previously, however, we direct attention to the following remarks by this physiologist, exhibiting, in an extraordinary degree, his very limited views of the relation between different parts of the circulatory system.

“If the movement of the blood in the veins were solely owing to the action of the capillaries, the ascent of the fluid would necessarily be uniform, and not in accordance with the causes which augment the force of the arterial blood. The degree of the heart’s energy, the respiratory motions, and the volume of the fluid in that case, would exert no influence on the venous circulation. But this is opposed to the testimony of daily observation. It is known for certain that what acts on the arteries acts also on the veins.”* Tome iii. p. 239.

It is here contended, that were the capillaries the cause of venous circulation, this would be uniform, bearing no relation whatever to the powers which increase the arterial; nor would the degree of energy with which the heart acts, the character of the respiration, or the quantity of fluid to be moved, exercise any influence on the contents of the veins. The strangeness of this opinion accords little with the established reputation of the writer. Suppose the capillaries to circulate the blood they receive without the co-operation of the heart and arteries, being themselves a source of motive power, they would clearly be liable to modifications according to the energy of the powers acting *a-tergo*, and the stimu-

* Leçons sur les phénomènes physiques de la vie, par M. Magendie, Tome iii. p. 143.

lating qualities of the vital fluid. Larger the volume of blood transmitted in the direction of the capillaries, and of course greater the quantity which they would receive and circulate. Their functions are capable of being either excited or depressed. If the proportion conveyed to them is less than usual, the veins will receive less. When the arterial circulation is the most active, the venous, according to our views, will always necessarily correspond. The two in health will ever be in strict and harmonious relation. The contents of both systems are accelerated by the same general causes; the one towards the capillaries, the other where the least pressure exists, which is mostly in the direction of the heart. The want of uniformity in the tension of the venous system is explicable only on capillary influence. We proceed now to the examination of his experiments, proving in his own words, "*tandis que la pression uniforme dans la generalite du systeme arteriel elle varie dans chaque partie, et pour ainsi dire, dans chaque tuyau du systeme venieux.*"

The instrument used by him has already been described. Its invention is due to Poiseuille. In previous strictures it was stated by us to be admirably adapted to determine the force of the heart, but incapable of indicating the momentum with which the blood moves in different parts of the arterial system. The one question is comparatively simple and easy of solution; the other is abstruse, exceedingly difficult, and perhaps not admitting of elucidation. The application of it to venous circulation is not free from objections, but it is sufficiently correct for our purpose. The instrument, indeed, will not show the ordinary force employed in the motion of venous blood, but will indicate the relative differences in its momentum in various situations. If the venous system he imagined to be divided into ten lesser systems, and an independent heart be regarded as propelling the vital fluid in each, the instrument applied to the vessels of these systems will exhibit the propulsive energy of the several hearts, but not of the force with which the blood moves in its ordinary or undisturbed condition in each system.

It has already been remarked, that when the course of the arterial blood is arrested, this acquires relations to the propelling power either altogether new, or greatly exceeding what is natural, and the truth of this observation will be illustrated in the present inquiry. Suppose the instrument to be fixed in any large vein, the blood cannot flow forward or escape from the pressure acting *a-tergo*; the only play of which it is capable, is derived from pushing the mercury in the hæmadynamometer a few lines in advance. If the ligature applied to the arm in venesection causes the blood to accumulate and to be projected with increased energy, this instrument, obstructing, in a similar manner, the venous current, will

produce analogous results ; and, therefore, will not afford any measure of the momentum of it in its natural circumstances ; at one instant accelerated, at another retarded, or perhaps moving in a retrograde direction ; and, moreover, the current during the experiment is withdrawn from the influence of one class of causes, to which some writers attach great weight, viz. the enlargement of the chest on inspiration and the dilatation of the right auricle. None of these conditions have been considered, nor was the possibility of their occurrence even suspected by the enterprising physiologist. He has conducted his numerous and ingenious experiments, as if the powers of life were as simple and easy of appreciation as the laws of purely physical machines. The modifying influence of vital properties has not only been discarded from his calculations, but any attention to it is treated with contempt and ridicule.

Understanding the capabilities of the instrument, we may examine the results which it furnishes. The numbers in which they are expressed require no explanation nor comment, except that they represent quantities which are measured by the millimetre, which is the thousandth part of the French metre, of about $39\frac{3}{8}$ English inches. The instrument is applied to the left jugular vein of a dog, and gives the following results : 15, 20, 14, 18, 15, 17, 18 millimetres.

When the animal struggled or made powerful expirations, the mercury suddenly rose to 35 and 40 mill., but immediately fell, on the respiration becoming natural, to 15, 20 millimetres.

It is subsequently fixed to the crural vein, and the mercury oscillates between 55, 60, 50, 45, 50, 55, 58 millimetres.

The difference between the pressure in the two veins is here shown to be very considerable. That in the one is indeed nearly three times as great as in the other, and yet it is referred to the same impulsive powers—the action of the heart and the contractility of the arteries.

He afterwards applies the instrument to the internal saphena vein, which is small, and the numbers were, 20, 22, 19, 22, 20. On compressing the deep-seated saphena vein, so as to arrest the circulation in it, the mercury rose to 25, 28, 30, 32 millimetres. On ceasing to compress, it again fell to 19, 21, 19, 20.

On compressing the vein, the sphere of circulation was of course narrowed. The instrument obstructs the motion of blood, giving rise to distension of the vessel, which distension increases ; consequently the pressure on the mercury will be proportionably augmented, which is indeed the fact. Such might have been predicted from knowing the effects of a bandage round the arm in venesection. What does the experiment prove beyond this simple and evident phenomena ? Can any other explanation be proposed to account for it ? The same experiment is performed on the ju-

gular veins. The instrument is fixed to one of the veins, and a ligature is afterwards applied to the other. Before the ligature is tightened, the mercury rose to 15, 17, 15, 16, 17, 16 millimetres. When tightened, it rose to 20, 25, 23, 26, 25. On removing the ligature, it again fell to 15, 16, 15, 17, 16.

These results are neither particularly interesting nor important. The experiments show, what no experiment was required to establish, that, if the blood cannot flow in one direction, it will escape in another; and further, when arrested in its course, that the tension in the vein where it accumulates will be increased.

The physiologist next endeavours to prove, that when the arterial fluid sent to an organ is diminished by tying a principal artery, the venous circulation is affected. The experiment, however, does not present any remarkable differences.

The left external jugular vein is tied, and the instrument is connected with the right. The right carotid artery is then compressed. The numbers indicated by the ascent of the mercury were, 20, 22, 20, 21, 19 millimetres. On ceasing to compress, they were, 20, 19, 20, 22, 21.

In this case there is no appreciable difference. To render the experiment more decisive, the artery is tied in place of being compressed. The results, however, are nearly the same. The left carotid artery is afterwards compressed, so that the brain receives blood only from the two vertebral arteries. On compressing the artery, the mercury stood at 15, 17, 14, 16, 15, 16 millimetres. On ceasing to compress, it rose to 20, 22, 19, 21, 20, 22 mill.

The difference even then in the degree of pressure indicated by the vein is very trifling. But what does the experiment demonstrate, or what is the value of the results to which it can possibly lead? It clearly shows that, when the quantity of blood usually sent to an organ is lessened, the vein corresponding to the tied or compressed artery receives a diminished supply, hence the tension in it is weakened. This is the only fact the experiment can establish. The modification in the tension of the vein does not prove the direct influence of the heart upon the venous column. If the circulation in the veins depended on this cause, on the withdrawal of the influence, the motion of the blood would naturally be expected to be arrested. In the last experiment detailed, however, no vital fluid, and consequently no impulse is transmitted to the brain through its two principal arteries, and yet the difference in the pressure indicated by the instrument is little more than fractional. When one artery only was compressed, the difference was not appreciable. Are these results such as would be anticipated from the doctrine that venous blood moves only in virtue of the direct impulse of the heart and the contractility of arteries? The mind they satisfy must be peculiarly constituted. Were they

much more decisive in their character, they would still be extremely questionable as data on which to raise just and comprehensive views. Four important vessels, two veins and two arteries, cannot be laid bare without acute suffering to the animal, and the torture is not momentary, but continues during the whole of the experiment. In addition to the pain which always modifies the vital phenomena, the ordinary conditions of cerebral circulation are disturbed quite as much as is compatible with life. The marvel is, not that a slight difference in the tension of the vein is observed under such circumstances, but that there is sufficient vitality to afford any indications of the laws or principles of life. Amidst this multitude of disordered actions, where is the eye or mind capable of separating the natural from the induced conditions? The analysis of them is much more difficult than the experiment.

There is one other experiment to which we shall, on this occasion, allude. Magendie was not fully satisfied with the results of the preceding experiments. He had not succeeded in intercepting the transmission of blood to the brain, which he deemed desirable in order to determine the pressure in the vein connected with the hæmadynamometer under such circumstances. The thigh appeared the best adapted to gratify the object of his research. Here it is not difficult to confine the circulation to two vessels, the crural artery and the crural vein. The latter, with the exception of a few branches, returns from the limb the blood conveyed to it by the former. When the branches are not compressed, the mercury oscillates between 55 and 60 mill. When the branches are compressed, so as to force the whole of the blood into the vein, the scale indicates—80, 85, 75, 85, 80 mill. On ceasing to compress, the mercury fell again to—62, 55, 58, 60, 58 mill.

Having ascertained the pressure in the vein, when the flow of arterial fluid to the limb is not interrupted, he compresses the crural artery so as to intercept completely the impulse of the heart. The tension in the vein is then observed to be 55, 50, 45, 42, 35, 33 mill. On allowing the blood to re-enter the artery, the mercury rose to 62, 60, 63 mill. On compressing the artery, the mercury again fell to 55, 48, 45, 40, 36 mill.

This experiment is intended to prove, that the pressure in the venous system is wholly referable to the direct impulse of the heart. Does such inference flow from it? When an artery is compressed, or a ligature passed round it, the blood continues to circulate towards the capillaries, and leaves it empty. In this case there is no column in the artery capable of raising the contents of a corresponding vein to an equal height. The blood having passed on to the capillaries and the vein, the tension in the latter clearly cannot be referred to any cause existing between the arterial capillaries and the left side of the heart. There is neither the impulse of this organ acting *a-tergo*, nor the column of blood

in the crural artery forcing this fluid along. Nor can it be attributed to any property of the vein. This is only a recipient and carrier of the blood. There is then only the capillaries that can exercise any influence. This experiment, but for a different object, had previously been performed by Magendie, and the results at which he arrived established the independence of the capillaries on the direct impulse of the heart. The experiment we have just analyzed shows that the tension in the vein is almost as great when the artery is compressed, as when perfectly free. The other experiment, to which we allude, satisfactorily proved that the blood continued to flow from the punctured vein, when the impulse of the heart was wholly intercepted. The two experiments establish the same fact, and corroborate the same train of reasoning. In the following investigations we shall endeavour to show that the diversity of venous tension is explicable chiefly on the action of the capillaries.

(To be continued.)

ART. III.—*Substance of an Introductory Lecture to a Course upon the Structure, Functions, and Diseases of the Eye ; comprising a Comparison of the State of Ophthalmic Science in Germany and England ; and a Recommendation to introduce the German Method of Instruction into the British Schools.* By ROBERT HAMILTON, M. D., F. R. S. E., Fellow of the Royal College of Surgeons, and one of the Surgeons of the Edinburgh Eye Infirmary. November 1842.

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THE value of Ophthalmic science is so great, that the importance of every thing directly bearing on it will at once be conceded. Accordingly, we might have availed ourselves of the present opportunity to introduce a sketch of its past history, which might have proved alike interesting and profitable. This, however, we at present forego, and we do so, from the desire to direct attention to what we consider a more important subject. As the great and ultimate end of all history, whether medical or general, should be to shed light upon our present path, and to afford guidance and instruction in our future course, we shall select one or two branches only of the history of ophthalmic science, and this not solely because they are important in themselves, but chiefly because they are fertile of suggestions which, if properly improved, could not fail, we conceive, greatly to advance the interests of the science in this country. Hence, we shall avoid all consideration of the condition of ophthalmology in remote antiquity, whether as alluded to by Herodotus, or as practised by the oculists of the

Roman emperors : in like manner, we shall pass by such traces as may be found regarding it in the dark ages, and even in more recent times, when the art was so much in the hands of itinerants and quacks. We shall come down to modern times, and even here shall confine ourselves to two localities in which the science has more or less prospered, namely, to Germany, and our own land. We shall glance at its recent history, and shall touch upon its present state in these countries ; considering the steps by which it has attained to the high pre-eminence it holds in the former, and whether there be any sufficient reason why it should be less cherished and less flourishing in the latter. Closely allied to these topics is the all-important subject of education, which may best be regarded in a twofold light, in reference to those who teach, and to those who learn. This most closely affects the pupil and the master, the public seminary and the public well-being ; and hence we shall make no apology for soliciting attention, on the present occasion, to the best modes of teaching and learning that science upon which we are about to dwell, and for recommending the adoption and application of the German method of instruction to the British schools.

We turn then, first, to Germany, more especially to Austria, and to its capital, Vienna, which has long been, as it now is, celebrated for its great pre-eminence as an ophthalmic school. The origin of this celebrity is somewhat variously accounted for, but the leading facts connected with it are these.

It is now nearly a hundred years ago, or in the year 1745, that the celebrated Gerard Baron van Swieten, under the auspices of the Empress Maria Theresa, re-arranged and new-modelled the Medical department of the Viennese University.* This distinguished physician had himself been the pupil of the great Boerhaave of Leyden, who, as is well known, was the master of many of those eminent men who, about the same period, laid the foundation of that celebrity which Edinburgh has now for a long time enjoyed as a medical school. The widely-spread fame of the commentator of Boerhaave, together with the great encouragement at that time afforded to men of science and literature to settle in the Austrian capital, soon attracted thither some of the most distinguished characters in Europe. One of these was Nicholas Joseph Pallucci, an Italian physician, celebrated as an oculist and lithotomist. In the year 1750, he was brought by Van Swieten from Florence, and introduced into the University of Vienna, and may be fairly said, as stated by a recent medical traveller, " to have

* In this sketch, we have freely availed ourselves of the able papers on the subject which appeared in the early Numbers of the *Quarterly Journal of Foreign Medicine and Surgery*, and which we had occasion to know were from the classical pen of our friend, Dr Mackenzie of Glasgow ; and also, of Mr Wilde's interesting communication in the *Dublin Journal of Medical Science* for November 1841.

laid the foundation of the ophthalmic school there ; for, although he was not a public teacher, yet the works he published on affections of the eye, and his expertness as an operator, generated a taste for that department of medical science that has gone on increasing to the present day." Pallucci died in 1797. His first work, *On a new Method of depressing Cataract*, was published in Paris in the year 1750, and probably procured for him that reputation which recommended him to Van Swieten. He wrote other books both upon the diseases of the eye, and on different surgical subjects. But, notwithstanding these labours of Pallucci, it is true, that, in the Austrian capital itself, Joseph Barth is usually considered as the founder of the ophthalmic school, he having been the first public teacher of the science in the Austrian dominions.

Professor Barth was born at Malta in 1745, and studied medicine first at Rome, and afterwards at Vienna. At the age of eighteen, he was appointed Professor of Anatomy to the University, under Störk, the successor of Van Swieten, and at a later period gave lectures upon ophthalmology. He is not much known by his writings on the subject, and, indeed, published but little. He had, however, many pupils who highly esteemed him for his talents and acquirements. The following tradition is still current at Vienna. A lady, attached to the court of the Empress, becoming blind, was pronounced amaurotic by her ordinary medical advisers ; her malady continuing to increase, Baron Wenzel was sent for from Italy, and at once declared the disease to be cataract, and removed it by a successful operation. So amazed was Maria Theresa at this sad display of Austrian surgery, that she forthwith established a special lectureship of ophthalmology, and Barth, in the year 1773, was called to fill that chair. In 1776, he was appointed oculist to the Emperor Joseph II. He long enjoyed this honourable distinction, and died in 1818.

Among the numerous pupils of this first professor we shall here mention four who were pre-eminent, Santerelli, Prochaska, Beer, and Schmidt. To Santerelli, the first of these, is undoubtedly due the original performance of the extraction of cataract by the superior section of the cornea ; a method which is now perhaps the most esteemed both in Vienna and London. George Prochaska held the chairs of physiology and of systematic ophthalmology in the University of Vienna ; and his character, both as a teacher and an oculist, long stood high. While Prochaska taught systematic ophthalmology in the university, his not less distinguished associate, Professor George Joseph Beer, taught practical ophthalmology in the Great Hospital at Vienna, and there attained the highest celebrity. He was first the assistant, and afterwards the successor of Barth, and practised his favourite art with enthusiasm for upwards of thirty years. He commenced as a private teacher about

the year 1798, and from that time till 1815, was allowed, with the unanimous consent of the profession, to be the most esteemed writer of his day, while he was not less distinguished as an operator and an instructor. Lastly, the fame of Vienna, as a school for the diseases of the eye, was greatly increased by Johann Adam Schmidt. He did not belong to the general hospital, nor to the University, but to the Josephine Academy, the school and hospital for the professional men preparing for the Austrian army. He is known most favourably by his ophthalmic writings, as well as by those on other subjects. These men have now all passed away from this fleeting state, and their places have been supplied by others whose fame in no degree falls short of that of their illustrious predecessors. Dr Frederick Jäger was long the favourite pupil of Beer,—he became his assistant, and son-in-law, inheriting his library, preparations, and instruments. He succeeded Schmidt at the Josephine Academy, where his teaching is, at present, one of the greatest professional attractions to the Austrian capital, and his operations are very generally esteemed as the most splendid exhibitions of eye-surgery in Europe. Dr Rigler is now his assistant. He also is engaged in teaching, and is regarded as a man of high scientific attainments, and great manual dexterity. Dr Anthony Edler von Rosas succeeded, upon the death of Beer, to the practical chair in the University, and thus became the clinical instructor in the great public hospital. He disputes the post of celebrity and distinction with Jäger; his writings are voluminous and esteemed; his operations are universally allowed to be in a high degree dexterous, and his knowledge of the history of the science is most extensive and complete. Dr Gulz, an accomplished operator and able writer, was Von Rosas's assistant at the time of our late visit to the school.

Having thus supplied the names of some of the individuals who have most contributed to establish the Viennese school of ophthalmic science, and to support it at the enviable height it now maintains, it is gratifying to add that the Austrian government has not been behind hand in exciting these able men to their labours, and in yielding them all possible encouragement and support; while, at the same time, it has made and enforced regulations which have secured the greatest skill in this department for the benefit of its subjects, and, in truth, have indirectly made Vienna the great cradle of ophthalmic accomplishment and skill.

Imperial patronage, as may be gathered from the preceding details, has been conferred in the Austrian capital upon no fewer than three professorships of ophthalmic science, now, we believe, comprised in two, and in both of these, assistants also are provided, who reside constantly in the splendid hospitals, civil and military, which government also supports. The attendanee upon

these courses, on the part of students who seek for the degrees of Doctor in Medicine and Surgery, is made imperative. In the third year of a student's curriculum he must attend the lectures of the professor of systematic ophthalmology in the University; and no practitioner, though possessed of a degree in medicine, can practise publicly as an oculist, in any part of the Austrian dominions, without having undergone a special examination on the diseases of the eye, and having obtained a diploma for this particular branch. "In all the public courses of medicine and surgery, an examination of the enrolled students is held by several professors every half-year, in the presence of one or more of the other office-bearers of the University; and in order to be admitted to an examination for a degree, the candidate must produce certificates of having acquitted himself respectably in three Semestral (six months) examinations; of having completed his fifth year of study; and of having publicly treated within the last half-year, two patients in the clinic for internal diseases, the cases of which patients he must at the same time present to the Faculty, written in Latin." Those students, again, who aspire to the degree of doctor in surgery, or of ophthalmology, must, moreover, have attended the course of practical ophthalmology, as conducted in the great hospitals, the civilians in the civil hospital, the military in the Nosocomium Josephinum.

Our purpose in this survey, as already hinted, is to institute a comparison between the system now under review, and that pursued in this country, and to examine into their respective workings, and the grand result of each; and even from what has been already stated, we might perceive a great contrast in the teaching arrangements, to the manifest disadvantage of our native land. But the grand peculiarity of the German method has not yet been touched upon; and hence we proceed to allude to that clinical method of instruction to which, in truth, Vienna owes nearly all its celebrity. We premise that it differs *toto cælo* from that clinical instruction which exists among ourselves; and, as from personal observation we entertain a very decided conviction that this method of teaching, well conducted, is, of all others, the most important means of supplying a good education, not in ophthalmic science only, but in all the other practical branches of the healing art, we trust that no apology is necessary for somewhat fully insisting upon it.

Dr Beddoes, in a letter to Sir Joseph Banks, informs us, that the practice of giving regular lectures on the cases of patients under actual treatment, which, we need not say, is the grand characteristic of clinical medicine, was first established at the hospital of St Francis, at Padua, in the year 1578; and our distinguished fellow-citizen, Dr J. Thomson, who has so ably illustrated this as well as many other departments of our science, well remarks, "that the necessity which exists that students of medi-

cine, before leaving the academic benches, to take charge of the health and lives of their fellow-men, should have opportunities of witnessing the practice of physicians of experience and skill, must have become apparent almost as soon as regular schools of medicine were instituted." He adds, "that before the middle of the seventeenth century, the practice of delivering clinical lectures had been introduced into the medical schools of Holland, both at Utrecht and Leyden, at which latter school it was, that at the beginning of the eighteenth century, the practice was so successfully pursued by the illustrious Boerhaave, by whose pupils it was conveyed to other medical schools, and particularly to those of Edinburgh and Vienna." This statement brings us to the point in view, and directs our regards to the great school of this city, (Edinburgh), as well as to that other celebrated university to whose history we again revert.

We regret that we have neither the information, nor the necessary documents which might enable us to supply so minute an account as we could wish of the early clinical school of Vienna. We may state, however, that the medical clinic was united with the general hospital in the year 1784, under the direction of Maximilian Stoll; and we have seen that Professor Barth was appointed to the ophthalmic chair in the year 1773, in which he was succeeded in 1798 by Beer. How far Beer followed the exact method of Barth, we know not; and we cannot expressly say what was the plan of his own earlier instructions, presumable though it be, that one general method, more or less, pervaded the whole. Be this, however, as it may, Beer has himself informed us, that, after fourteen years of private instruction in his art, he laid the design of forming a special ophthalmic clinic before the Emperor. This design was approved of, and a portion of the Imperial Hospital was set apart for treating and teaching eye diseases; and he commenced his duties in this new office in April 1812. Being then but Extraordinary Professor, the students of the university were not compelled to attend his prelections; but men from every part of Europe soon flocked around him to profit by his instruction, and take advantage of the many opportunities which his situation afforded. In the year 1815, the extraordinary was converted into an ordinary professorship of practical Ophthalmology, and attendance then became a compulsory part of medical education.

Without, however, longer insisting upon the history of the introduction of Clinical instruction into the Vienna school, we proceed to describe it as we have ourselves witnessed it, and as it has been depicted by others; premising that, although the Ophthalmic clinic has its full share of pre-eminence, yet it is not confined to this department; on the contrary, the method is maintained by not fewer than five distinct and salaried professors,—two of these being occupied with what, in this country has usually been denominated

the Practice of Physic, divided into the consideration of acute diseases and chronic, a third with Surgery, a fourth with Obstetrical Science, and the remaining one with the subject now claiming our particular regard.

Clinical instruction in Germany is given under various distinct forms, of which the *Internal clinic*, and what has been designated the *External* are the most considerable. Not having ourselves witnessed the former of these, which ceases during the vacation, we shall supply a short abridgement of the account given by the graphic pen of Dr Mackenzie, who himself has so much improved the advantages it presents. The visit in the medical clinic occupied one hour every morning. The assistant, who is a graduate, and is styled the *Secundarius*, regularly follows the visit, and, along with those students who choose to attend, visits again in the evening. The duties of the *candidati assistentes*, or students who have the care of the patients, consist in examining the particular patient committed to their care publicly on his admission, and again at every visit; in writing out a *historia morbi*, and in keeping a careful journal of the symptoms and treatment. These cases are not written in a short and imperfect manner; but contain a faithful and minute account of the state of the patients at the last morning visit, at noon, and at evening, with observations in regard to the diagnosis, prognosis, and treatment. The reports are written in Latin, are publicly read at the bed-side, and on the dismissal of the patient are delivered to the professor.

The hospital accommodation for the Ophthalmic clinic consists of what is called the *auditorium*, a kind of reception hall into which the new patients are received, and where the professor and students assemble, and of two wards each containing twelve beds. The auditorium is well lighted, and coloured green. The windows are so supplied with shutters and curtains that the light can be in an instant increased or diminished. It affords accommodation during lectures for 150 students, and has a portion of an oval form slightly raised, called the *cathedra*, whence the lectures are delivered, and where the operations are performed, being large enough to contain a patient, along with the professor, the assistant, and the pupil, to whose care the patient is entrusted. Each of the wards, one for males, and another for females, is about the size of the auditorium, is also coloured green, and contains twelve beds. Frank, at Pavia, had rarely above eighteen patients in his medical clinic; and it is important to note that this limited number is essential to the success of the system.

The instruction in the ophthalmic, as in the other clinics, is continued uninterruptedly for ten months. The lectures on practical ophthalmology are delivered every morning, Saturdays and Sundays excepted, from ten to eleven o'clock, comprising first the

anatomy and physiology of the eye ; then a few lectures on the manner in which the eye should be examined ; next on the pathology of the organ, and the medical and surgical treatment of its diseases, the whole concluding with the history of Ophthalmology. Daily, again, from eleven o'clock to twelve, Saturdays and Sundays included, the strictly practical instructions are given, partly at the bed-sides of the patients, and partly in the review of the out-patients who apply for relief. Every new and interesting patient, whether he is to remain or immediately to depart, is brought into the auditorium, and placed in the cathedra. One of the students now presents himself as the assistant or ordinarius for the patient, and undertakes the examination of the case under the correction of the professor.

This last statement brings into view what is called the *External clinic*, and which consists of nothing more than the adaptation of the clinical method of instruction to the treatment of the out-door patients of an hospital,—the number, at the same time, being kept small. With the existence of an hospital, however, it has no necessary connection, as it may often be witnessed in operation, when the internal clinic, as during vacation, is closed. In these latter circumstances, again, it corresponds in many particulars with our dispensaries, and might most readily and advantageously, with a little management, be carried on in some of these institutions. In the north of Germany this system is usually designated by the name of *Polyclinic*, as the number of out-patients who present themselves usually much exceeds the number of in-patients ; whilst another name it receives is that of *Ambulatorium*, from the applicants making it their business to come at regular hours, and retiring again as soon as their prescriptions are prepared, and their medicines delivered. Professor Chelius informed us, that at Heidelberg a list of the students who engaged in this duty was kept, and that they took the cases which presented themselves, very much in rotation, the privilege being restricted to those who were considered equal to the responsibility. With a new patient, the *Ordinarius* next in turn presents himself before the professor and his fellow-students. He immediately commences his examination ; the professor, at the same time, by such inquiries as he deems necessary, satisfying himself of the nature of the case ; the bystanders also examining for themselves, and narrowly observing all that passes. This done, the professor demands of the ordinarius the nature of the complaint before them ; and, if a wrong answer is given, tries, by some leading question or hint, to make the pupil correct himself. The disease at length ascertained, interrogatories are put respecting the diagnosis, prognosis, and *methodus medendi*, and the treatment to be adopted being agreed upon, the assistant withdraws the patient from the circle, so mak-

ing room for a fresh case. He then enters the name of his patient in the register, with the name of the disease, the prescriptions, &c.; and furnishes the patient with the receipts for the various medicines he orders, previously bringing them to the professor who, on finding them correct, or animadverting upon them when necessary, signs them for the apothecary. If the case be surgical, and requires dressing, or some minor operation, this is immediately done, sometimes by the professor, and often by the pupil under his eye. At all future visits, the same student continues to take charge of the same patient, and thus watches over all the phases of the disorder for better or for worse.

In addition to these two principal clinics, Internal and External, a third must be added, which has very properly received the name of *House clinic*. It owes its origin to the fact, that most of the ophthalmic professors in Vienna are in the habit of having, in their own dwellings, a set hour for the reception of patients among the middle and humbler classes of society, to which their private pupils always have free access, and to which strangers are usually invited. Many of the less severe diseases of the eye may here be observed; the professor's treatment is fully exemplified, and many hints, and much familiar advice is supplied.

One other mode of instruction which prevails at the Vienna school, though not strictly belonging to the category, must not be passed over, known by the name of *Privatissima*. The ophthalmic *privatissimum* consists of a short course of the operative surgery of the eye upon the dead subject, wherein the professor performs the different operations, and explains, as he goes along, every step and minute point in their performance, after which, he directs the pupil in the repetition of each of them. After attending one of these private courses, the pupil is allowed to operate upon the living subject. Each class of this most useful instruction is confined to about six pupils, and the most eminent professors of the art, such as Rosas, Jäger, and their assistants, are now in the habit of conducting them.

The practical results of this system of instruction are altogether such as a careful study and examination of it would naturally lead us to anticipate. Hence, respecting ophthalmology, it is a fact, that from this school there has emanated a host of men who have trodden in the footsteps, and many of whom in every way rival the high character of their respected masters, and who now, in their turn, and in other spheres, have become centres of attraction and information. Thus the benefit has been spread very generally over Germany. It is in this way, that we almost everywhere find names that are highly venerated in the science,—names such as Fischer at Prague, Walther, Schlagintweit, and Stromeyer at Munich, Chelius at Heidelberg, Von Ammon at Dresden, Ritterich

at Leipsic, Jüngken at Berlin, and many others it would be tedious to enumerate. Hence the high and forward state of the science in that country, and the great number of expert and accomplished oculists. And passing from this to the other practical branches of the healing art, whenever this clinical system is brought into operation, there the best results are found to follow. It is useful not more to the taught than to the teacher; and witnessing it with delight, in daily and active operation, at such places as Bonn, Heidelberg, Vienna, and Berlin, under the most experienced and sagacious professors, we could not repress the wish that it should be forthwith introduced wherever good and substantial education was desiderated for the credit of the profession, and the well-being of the community.

Having now endeavoured to furnish a slight sketch of the recent history, and present condition of ophthalmic science in Germany, and this in connection with its system of clinical instruction, we turn to Britain, and here, avoiding alike partiality on the one hand, and prejudice on the other, would make a corresponding survey.

The first observation which suggests itself is, that Britain was not without its share of those self-styled oculists who everywhere endeavoured to monopolize practice, and, till a late period, were a disgrace to the profession. Among these the most famous for several generations, we are informed, was a family of the name of Taylor, one of whom gives the following amusing account of himself. After curing all that were curable in his native country, he travelled to the continent, and there maintained a splendid equipage, his carriage being drawn by four horses gaily caparisoned, and attended by many out-riders; the pannels of his carriage were painted all over with eyes, to denote his profession, and his assumed motto was "*Qui visum dat, vitam dat.*"*

Britain, however, does not seem to be of all others the most congenial soil for charlatans; or, at all events, we may congratulate ourselves, that, from an early period of English surgery, many authors set themselves to oppose and banish quackery, and become good oculists, while they were, at the same time, learned and able surgeons. Thus Richard Banister, who wrote an excellent work on the Diseases of the Eye towards the commencement of the seventeenth century, designates himself Master in Chirurgery, Oculist, and Practitioner in Physic; and wishes his reader to understand, that his special breeding had been in the general skill of surgery. He tells us that, in the methodical practice and cure of blind people, by couching of cataracts, our English oculists had always a special care, according to the art, to couch within doors, out of the open air, to prevent further mischief; while some of the

* See Mr Middlemore's Treatise—Introduction.

mountebanks take their patients to the open market, and there, for vain-glory's sake, make them see, hurting the patients only to cause the people wonder at their rare skill. In early English surgery, we have the respected names of Wiseman, Turner, and Cheselden, whose works testify that they were practically acquainted with ophthalmic maladies, and attended to them in common with other diseases. To the same highly respectable class belong the names of Pott, Hey, Ware, Saunders, and Wardrop; to which have succeeded, in the present day, many more who now enjoy a proud and well-merited celebrity.

It was not until the year 1805, that the Metropolitan institution, now designated the Royal London Ophthalmic Hospital, was founded for the especial treatment of eye diseases; and this, so far as we know, was the first establishment of the kind formed in the kingdom. The original intention was, that it should be a dispensary only; but the addition of an infirmary, in other words, of accommodation for in-door patients, was soon conjoined, and has been maintained to the present time. The late John Cunningham Saunders had the honour of being its founder; and his eminent success and valuable works give sure pledge that, had his life been prolonged, he would have proved one of the most successful improvers of the art. From the first he was assisted by the now venerable Dr Farre, who, for a long term of years, has done much for the advance of the science; and he was succeeded by Messrs Lawrence and Travers, two valued names, which are an honour to the profession. These gentlemen have been succeeded by the present officers of the establishment, who, especially Messrs Tyrrell and Dalrymple, by their writings as by their skill, have greatly distinguished themselves.

Much about the date of the founding of this hospital, another sprung up in the metropolis, which is now known as the Royal Westminster Ophthalmic Institution, and which Mr Guthrie superintends with so much credit to himself and benefit to the public. Nor, though later as to date, must we omit, as associated with the London school, the beautiful institution connected with the splendid establishment of Guy's, known under the name of Guy's Hospital Eye Infirmary, ably conducted by Mr Morgan, and in which we have a specimen of what may be done by private benevolence; and where, in fact, is all the machinery of what, if properly worked, might constitute an efficient ophthalmic clinic. To these we have still to add, the Cork Street Eye Dispensary, a private establishment, which the well-known, expert, and fashionable oculist Mr Alexander superintends, and to which, we believe, Mr Alexander Junior is assistant-surgeon; and the North London Eye Infirmary, which was founded in January 1842. Establishments of this sort were found so useful, that they soon began to spread from the capital into the pro-

vinces. Sir William, then Mr Adams, speedily founded one at Exeter, well known under the name of the West of England Eye Infirmary ; and there now exist, in the southern parts of England, one at Bath, instituted in 1811 ; one at Bristol, a dispensary, founded in 1812, and ably conducted by Mr Estling ; and a third at Plymouth. About twelve or fourteen years ago, an Eye Infirmary was established at Norwich, conducted by Dr Evans, and Mr Hull (now M. D.) ; and which is productive of great benefit to the public in the Eastern counties. In the great towns of the north, many flourishing institutions of this sort are to be found. Thus there is the Birmingham Eye Infirmary, where Mr Middlemore exercises his skilful benevolence, having six beds for in-patients, whilst more than 2000 appear annually as out-door patients. At Southam, in Warwickshire, there is an Eye and Ear Infirmary, which was established in 1818 ; and in York an Eye Institution, with the particulars of which we are not familiar. At Leeds there is an Eye dispensary, where Messrs Nunneley and Braithwaite officiate. At Manchester there is an excellent Eye hospital upon the same general plan, and having about the same extent of accommodation and number of patients as the Birmingham Infirmary. Here Messrs Hunt, Brown, and Walker have distinguished themselves. At Liverpool there are two institutions of this kind, and at Newcastle one ; and, to come to Scotland, there is an admirable Eye Infirmary at Glasgow, provided with twelve beds, and furnishing advice and medicine to about 1200 or 1300 out-patients annually, by the able hands of Dr Mackenzie and Professor Rainy ; whilst in Edinburgh we have two Ophthalmic institutions, the one, the Eye Dispensary, which owes its origin in the year 1824 to the energy and benevolence of Dr J. A. Robertson, and the other, a small infirmary, which Dr Watson had the merit of founding in 1834.

These are all the ophthalmic institutions in Britain of which we have procured intelligence ; and now, we turn with pleasure to the sister island, where the names of Hewson, Carmichael, Jacob, Wilde, and others are familiar to the ophthalmic student. In the Irish metropolis, Dr Jacob, several years ago, established the Pitt Street Eye Dispensary, which is now removed to the City-of-Dublin Hospital ; and Mr Wilde, two years ago, instituted the Frederick Lane Dispensary for Diseases of the Eye and Ear, which he has since efficiently maintained ; whilst two wards have long been appropriated to the treatment of eye cases in Stevens' Hospital. To these establishments, the eye first and naturally turns, for those facilities which are required for teaching that salutary art which they are engaged in administering ; whilst, at the same time, we are far from overlooking our larger and richly endowed general hospitals, which, failing the other class of esta-

blishments, receive the cases of eye diseases into their wards, where much skill and address are exercised in their treatment.

The question, then, here naturally suggests itself, do these excellent institutions, whether general or particular, supply those opportunities which are desiderated for the efficient teaching and learning of ophthalmic science? or rather, are the opportunities which they afford any where made available to an extent that is in any degree satisfactory or sufficient?

It is impossible to cast a glance at any of these institutions without having it forced upon our conviction that they were primarily and especially intended "for the relief of the afflicted poor;" and that any thing which interferes with this benevolent purpose is not only an incumbrance but an injury. In their practical working in all our larger cities, if at all well conducted, the number of applicants is great; the time required for each is considerable, and must therefore be limited to what is absolutely required for the exigencies of the case. From 1000 to 2000 patients per annum constitutes the average number in our provincial establishments, and where the hospital is opened four days a-week, supplies from five to ten new cases daily, besides the many scores of old ones, which crowd regularly to receive the benefits of the charity. In a word,—with his steadiest exertion, and with all that quickness and tact which practice alone can give, it occupies a surgeon not less than one or two hours, and sometimes more, in the unceasing task of examining and prescribing, and ere his work is performed, with the strictest attention to point and promptitude, the time of the visit is elapsed, the convenience of the applicant is compromised, and his own powers are fatigued and exhausted. In the Royal London Ophthalmic Institution, where last year upwards of 6000 patients were admitted, and who have regular access to the institution four times a-week, the daily visitors, new and old, amount to many hundreds; and though two medical officers at a time afford their gratuitous and invaluable services, yet several hours necessarily elapse ere their weary task is fulfilled.

We mean not to affirm that no profit arises to the profession from this exercise of their benevolent skill in ophthalmic establishments and in great general hospitals. A benefit accrues to the assiduous medical officer, who is here presented with a large field of practice, which cannot be cultivated without a rich return; and the writings of Lawrence, Travers, Mackenzie, Guthrie, Tyrrell, Middlemore, Watson, and many others, abundantly prove that these gentlemen have worked for their own improvement, as well as for the benefit of the science. Nor do we deny that the devoted pupil also, who enters himself at one of these establishments, by patience and prompt seizure of passing opportunities, derives benefit. But this is only by the way; and his presence, interrogations, and

manipulations, are generally out of place, and a source of annoyance to the patient.

It is, however, not less true, that though the relief of the poor patients be the primary object of these benevolent establishments, it need not be the only one; and existing where medical schools and universities are established, there should be no difficulty in making arrangements of such a nature, that while one class of the applicants should receive all possible professional attention, another set, without suffering detriment in this point, should be made available for the scarcely less important ends of medical instruction. For this purpose, some plan corresponding to what has been above described as the External or Internal Clinic of Germany, should, as of necessity, be adopted; the patients would require to be limited as to number; so, likewise, would the students, who must needs be of a class which had made considerable progress, and were ripe for engaging in practice; and finally, the practitioner would require time, and, being free from bustle and perplexity, should have opportunity to address himself, not merely to the relieving of the patient, but especially to the instruction of the pupil.

But leaving in our rapid survey the Eye hospitals of Britain and Ireland, let us turn to her Seminaries of medical education, and inquire what provision they make for ophthalmic instruction.

We have now many local and provincial schools scattered throughout the country—too many, we fear, for the purposes of substantial and extensive medical instruction; and Birmingham and Manchester, according to our information, of all these schools, are the only ones where instruction upon Ophthalmology is afforded. Turn we now to our metropolitan cities and universities, inquiring, how stands the matter in them? We learned lately in London, that there was no distinct course of lectures upon the subject given there at any of the schools, nor at either of its colleges; nor was there any immediate prospect of such a course being provided. Dublin is decidedly more fortunate; for there both Dr Jacob and Mr Wilde are in the habit of delivering courses of lectures on ophthalmology; the former in the Baggot Street City-of-Dublin Hospital, and the latter in the School of Medicine and Surgery, Park Street; whilst in Scotland, Dr Mackenzie has for many years been in the habit of giving a full and regular course within the walls of the college at Glasgow; not, however, be it noted, as one of the professors of the university, but as Waltonian lecturer only: and in Edinburgh, the late Dr Hunter, whose promising talent excites the deeper regret for his early death, gave several regular courses on the subject of Eye diseases; whilst my friend, Dr Robertson, has been in the habit of giving prominence to this branch in his lectures upon Surgery.

From all this, then, it would appear, that, with the partial exception of Glasgow, no chair for teaching ophthalmic science exists in

any university within the British empire ; a sad blank, which can only be very partially supplied by the professors of Medicine and Surgery, however ably they may handle their respective and extensive branches ; and which we have reason to know is to an extent rather to whet than to satisfy the appetite. In filling up this slight sketch of the state of ophthalmic instruction in Britain, we need scarcely add, that the government of the country, or rather the Crown, has done nothing to supply, what we now venture to characterize as a very great and decided deficiency.

We have still to insist for a little upon Clinical lecturing ; a practice which, as before observed, was pursued by Boerhaave at Leyden, and was introduced by his pupils into the schools of Vienna and Edinburgh ; and we shall now venture to revive the recollection of its history in this great seminary, mainly in the strong and masculine language of the late Dr Gregory. “ Dr John Rutherford, the original professor of the practice of physic in this university, had the merit of beginning the medical clinical lectures, and had them all to himself for seven or eight years ; but as soon as he found that some of his colleagues chose to undertake them, he withdrew from them. For some years afterwards, Dr Monro *primus*, Dr Whytt, and Dr Cullen, had the clinical lectures among them. From 1766 to 1773, all the time that my father was professor in this university, he and Dr Cullen had the winter clinical lectures between them ; during which time, not more than one or two summer courses were given, and these by Dr Francis Home only. Soon after my father's death, Dr Cullen's family prevailed on him to withdraw from the clinical lectures, perceiving that this labour, in addition to his other, was too much for him. Drs Plummer, Alston, Monro *secundus*, Black, and John Hope, would never take any share of the clinical lectures. When I was appointed professor of physic in 1776, not one of the senior professors, Monro, Cullen, Hope, Black, would take any share of them ; of course they fell to the share of the two junior professors, Dr F. Home and myself, and we had them entirely between us two for fourteen years. I had the merit of prevailing with Dr Daniel Rutherford to take share of these lectures, though I found it no easy matter to accomplish ; nor do I believe I should have succeeded, and I certainly should not have continued to take share of them myself, if the labour had not been made lighter, or at least less frequent in its return, by our junior colleagues, Drs Duncan, Hope, and Home sharing it with us. Though I have bestowed much good advice upon him for this purpose, I have not yet prevailed on Dr Monro *tertius*, to take any share in these lectures. The plain truth is, that they are so severe a labour, both in point of attention and time, that all of us feel them very irksome, even though our time of attendance is but three months ; and as clinical lectures cannot be prepared before hand, as those

on every other branch of physic may be, and ought to be, the incessant drudgery of preparing them from day to day, and the consequent interruption of all other study, and much other business, is often very inconvenient, and sometimes quite intolerable."

In addition to this statement of Dr Gregory, it must be mentioned, that he himself ceased to deliver clinical lectures for many years before his death, and that they were then maintained by four of the members of the Medical Faculty in rotation; and that during the whole of this long period, extending to well nigh a century, this right to deliver clinical lectures in the university was not dependent, to use the words of Dr Thomson, "upon any direct appointment given by the Crown, or by the patrons of the university, or by any rules or regulations embodied by the patrons in the commissions of the professors which they nominated, but on a private arrangement between the *Senatus Academicus*, and the managers of the Royal Infirmary, in consequence of which, each member of the faculty was entitled in his turn to take the medical charge of certain wards in the hospital, and to deliver lectures on the cases of the patients which they contained."* To this we have only to add that, in the year 1803, the Crown appointed the late Mr James Russell to the *Regius Professorship of Clinical Surgery*, a chair which is now ably filled by Professor Syme; and in the year 1829 the managers of the infirmary, in the exercise of their own powers, authorized the senior physician and senior surgeon in attendance, and whether members of the medical faculty or not, to deliver clinical lectures; which, though not recognized by the *Senatus Academicus*, are so by the Royal College of Surgeons of Edinburgh, and by most of the other medical boards.

Such, then, is the history and constitution of the clinical lectureships established in this school; and as to the nature and extent of the instruction afforded to the pupils, we need scarcely say any thing, as most of those we now address have had personal experience of its working. One or more wards are assigned to the clinical teacher, into which he admits such patients as best suits his purpose; these are visited by him and his pupils once a-day at the regular hours of visit; their cases are carefully drawn up by his clerks, and the pupils are permitted to copy them into their own case-books. The successive daily reports may be added at each visit, as they are dictated at the bed-side of the patient by the professor or teacher. To see and hear the professor examine and prescribe is all that the pupil, generally speaking, has to do with them, though he may frequent the wards during the intervals of the visits. Two clinical lectures are given each week, when the teacher explains the nature of the cases, and the rationale of the treatment, with such other remarks as appear to him best cal-

* Additional Hints respecting the improvement of Medical Instruction in Edinburgh University, 1826.

culated to illustrate the disease. That this has been, and is still useful in its way, we mean not to deny ; for what system, worked by such men as *Monro*, *Cullen*, and *Gregory*, could fail to be beneficial, and to command celebrity? But, notwithstanding, we contend that in many respects it is defective ; its style is still essentially didactic ; all its value emanates from the teacher, and may never reach the perception, nor excite either the attention or the energies of the pupil ; in these respects it differs wholly from the clinics of Germany, which, though they may have originally sprung from the same source, have eventually taken a different direction, and assumed an essentially different character.

This conclusion appears so clear and undoubted, that now, in again adverting to the great matter in hand, viz. the best mode of teaching the practice of the healing art, and of conveying instruction in the ophthalmic, as well as other practical branches, we consider any laboured or formal comparison of the two systems and schools as in actual operation, in their respective localities, as altogether superfluous. *1st*, In Britain, the system has received no royal, no government patronage ; *2d*, It has received no university protection in the schools generally, not excluding *Edinburgh* ; *3d*, There is no professor of Systematic ophthalmology ; *4th*, There is none of Practical ophthalmology ; and attendance upon such courses is necessarily nowhere made imperative ; *5th*, As a recognized part of the school, there is nowhere an Ophthalmic hospital, nor ophthalmic wards ; *6th*, There is no Internal clinic ; *7th*, No External ; and *lastly*, no *Privatissum* ; and hence, those pupils would, indeed, greatly deceive themselves,—as would their friends and advisers,—or would be endowed with powers altogether extraordinary, who, destitute of those rare advantages which attract professional men from every part of the world to Germany, would for a moment suppose that they are as well without them, and are placed in circumstances as favourable as they could desire. *Edinburgh* has had its clinic, and has greatly profited by it. But is that clinic perfect ? Is it unsusceptible of improvement ? We believe not ; as contrasted with Germany, it is, in various particulars, woefully behind ; nay, it is wholly deficient. She has altered and improved in other matters ; we would urge her, as she values the stability of her high character,—and the same advice we would extend to other medical seminaries,—to improve in this important particular. If one does not, another will, and will reap the benefit. To feel the full importance of the mode of instruction we advocate, it may require, perhaps, to be seen as well as described ; but it should not be difficult to picture to one's-self a man properly qualified and selected ; such a man as a *Chelius*, a *Jäger*, a *Dieffenbach*, and many more, thus receiving at once his patient and his pupil,—to observe his whole carriage towards both, bland and yet business-like, kind and judicious ; to no-

tice the promptitude,—the kind of instinctive glance with which he recognizes the character of the malady,—with which he certifies himself of its real nature, the address with which he uses the appliances of his art, marks their effects, watches the result, and, with the case actually before them, initiates his eleve into all his skill, from day to day, from month to month. We fain hope that no one inclines to regard us as too urgent or importunate in this matter. In case they do, however, we corroborate our convictions with the sentiments of other and wiser men. “Clinical lectures,” says Sir James Clark, “form the most important branch of instruction in the whole medical curriculum, as far as regards the pupil, and the most difficult as it respects the professor.”* “In France,” says Dr D. Johnston, “and perhaps even more in Italy and Germany, clinical instruction forms the most important part of general medical education.”† And once more, Dr J. Thomson, who has given much of his attention to the whole subject, declares that “clinical teaching is the most important and difficult duty in which a teacher of medicine can be employed.”‡

Since these pages were penned, we have come to the knowledge of various movements for the promotion of the objects here recommended, which, far from damping our feeble efforts, would only excite us the more, until the beneficial object shall be accomplished. We have been recently informed, that, of the recommendations which were embodied in the report presented by his late Majesty's Commission for visiting the Universities and Colleges of Scotland, one was, that there should be appointed a Professor of Clinical Medicine, whose office and duties should be permanent,—an appointment which could scarcely fail to advance the plan here recommended. We have also learned, that, a few years ago, one of the Patrons of the Edinburgh University, laid on the table of that honourable board, a motion to the effect, that the patrons should institute a chair for the purpose above stated; which motion, however, was not prosecuted at the time. Again, although no hospitals nor lectures for instruction in Ophthalmic science are anywhere provided by the universities and great medical schools, and consequently cannot be enjoined upon any, yet, in the printed Regulations of the Army Medical board, we read, “that it will be considered an additional recommendation to the candidate to have attended an establishment for the treatment of diseases of the eye;” while in the corresponding official document of the Navy Board, it is declared “that a preference will be given to those candidates for the service who, by possessing a knowledge of the Diseases of the Eye, appear to be more peculiarly eligible for admission to the service.” That a corresponding feeling, induced by these regulations, and by like honourable motives, widely pervades the class of students is mani-

* Observations on the system of Teaching Clinical Medicine in the University of Edinburgh, 1827.

† History of the present Condition of Public Charity in France, 1829.

‡ Loc. cit., p. 38.

fest from the complaints which we have frequently heard expressed, that no adequate provision has been made for teaching this department; and is still more demonstrated by the fact, that, in the year 1838, a petition was prepared and numerously signed by the medical students and graduates of the University of Glasgow, and by them presented to the Honourable the Senatus Academicus of that institution, in which, among other important suggestions, they petition, "that, with a view to fill up what they consider desiderata in the medical curriculum, they respectfully entreat the honourable and learned Senatus to render imperative upon future graduates a course of classes in addition to those specified in the late public regulations, amounting to six, and one of which was upon the Diseases of the Eye."

Gentlemen, having lately, with the highest satisfaction, had an opportunity of witnessing the operation of the admirable system of instruction upon which we are now dwelling, and having, moreover, we hope, somewhat profited by it, we trust we may stand excused, if we feel solicitous that the knowledge of it, and the benefits accruing from it, may be spread as far and wide, and as rapidly as they are found really to deserve. We forget not how little it is that can be accomplished by the individual who now addresses you; but that little he would not leave undone. He can avail himself of such an opportunity as that you have now so kindly conceded; and can request you to give your attentive consideration to the subject. Had he the honour of gaining for a moment the ear or attention of any of the more leading and influential members of the profession,—any of those who so laudably exert themselves in the great subject of medical education and qualifications,—he would particularly solicit their attention to the matter. Did they at all see it in the light in which it has been regarded by many most competent judges, then, in their intercourse with our statesmen and legislators, they could scarcely fail to suggest afresh, because it is not for the first time, that there is a form and method in which, at a very small pecuniary outlay, and by judicious patronage, they could not fail to act, without conferring a great boon upon their country, and an honour upon themselves. In their intercourse, moreover, with the Honourable Patrons and Governors, or Directors of our Universities, they might suggest to them that here was a mode, it might be wholly free from expense, in which they could greatly advance the prosperity of the seminaries under their charge; and once more, there is another class, consisting of our Senatuses and Professors, and still more, our Managers of hospitals, who, by them, might effectually be urged to recognize the pressing and vital importance of these simple means of genuine clinical instruction, in carrying forward the great and benevolent objects they are associated to promote.

In my own most limited sphere, again, having assumed the high-

ly honourable and responsible duties of a teacher, I would anxiously endeavour to afford something like a specimen of what is here so earnestly recommended ; and I feel grateful that arrangements have been made which afford great facilities for the execution of the plan.

* * * *

In conclusion, Gentlemen, notwithstanding our high estimate of the value of the plan we have attempted so imperfectly to sketch, and of the importance of its introduction into this country and school, it is not without many anxious feelings that we adventure upon the somewhat novel, most difficult, and important course. We do indeed entertain a very deep and most sincere conviction of our own incompetence to do full justice to the task. If the plan fail, we are convinced this will result, not from the badness of the cause, nor from any defect in the importance and excellency of the scheme, but solely from the incompetency of him who undertakes it. Should it unfortunately be our lot to be disappointed in our hopes, we believe it will be in a good cause ; and though success may not attend our labours, we doubt not that, under brighter auspices, and in abler hands, the object will one day be accomplished, it may be here, it may be elsewhere, to the joy and gratitude of many a thankful recipient of its benefits.

Postscript.—Since these pages were printed the following important particulars have been kindly brought under our notice. In the introduction to Dr Graves' valuable *System of Clinical Medicine*, published in 1843, a short account is given of the German system of clinical instruction, to which we beg attention ; and we are informed that Dr Graves introduced the system into the Meath Hospital, in Dublin, as far back as the year 1821. We must, however, request that the Doctor shall be himself heard. "Eleven years experience enables me strongly to recommend the method of instruction pursued in Germany. Since my appointment to the Meath Hospital, I have had extensive opportunities of observing its good effects. No session has elapsed without furnishing proofs in its favour." And again, in a postscript, dated 1842, he remarks, "twenty-one years have elapsed since the preceding lecture was delivered in the Old Meath Hospital, and my subsequent experience has amply verified the opinion I therein expressed." (P. 10, 11.) Again, we have recently received a letter from a kind correspondent in London, who writes, It is intended, at the

* to give a full course of ophthalmology this spring, (1843.) Anatomy, physiology, optics, as applied to vision, general and particular pathology, and the surgery of the organ, will be the subjects treated by the various officers. We shall adopt the plan of the external clinic, with the exception of not permitting (at present) the pupils to take charge of the patients. We think this would be

attended with great difficulty here, where we cannot compel the necessary attendance and punctuality of pupils, or out-patients.— And once more, Mr Wilde has done us the favour to state that during his course of lectures in Park-Street School, during the current spring, he purposes giving practical instruction in it after the Vienna method. All this, together with the interesting coincidence that Dr Bennett has, this session, commenced a course, after the fashion of the German clinic, in connection with the Edinburgh Royal Dispensary, bids fair, we trust, for the speedy introduction of that mode of teaching which is considered by so many as the most useful and the best.*

ART. IV.—*Extract from an unpublished Work on the importation and propagation of Plague and other contagious Diseases.* By Dr FERGUSSON, Inspector-General of Army Hospitals.

Of Marsh Miasmata and Malaria.

THIS is a comprehensive and most important subject, for the fevers which these produce rage throughout the world whenever not only a marshy but an unventilated surface of any kind under a high temperature is exposed for a sufficient length of time to a powerful sun; and so multifarious have been the speculations, so inscrutable many of the phenomena when taken in all their bearings, and so contradictory some of the alleged facts, that whoever tries to explain them must lay his account with falling into difficulties from which he cannot easily extricate himself. In fact, there is scarcely a position he can take up that, viewed altogether by itself, would not prove untenable. No one can yet tell what malaria is—of what elements composed—or why it should appertain to certain lands and forms of country, eschewing others where the temperature is equally high, without such difference in the altitude, exposure, and other circumstances of the land, as to account for the exemption. We can only deal in feasibilities, candidly stating all the facts that present themselves, and by induction from these, try to array a body of proof—that, taken in the whole, will amount to demonstration of the existence—the properties, and effects of malaria.

It is certain, in the *first* place, that febrile malaria is a telluric poison, being a production of the earth's surface,—never of the ocean's. It arises out of water in the decrease, and is as certainly extinguished by it on the flood, as fire is extinguished by the same element;—paucity of water, where it has previously abounded being one, although not the only condition of its existence,—abundance—of its extinction. Drying marshes, then, are by far its

* See additional information in a highly interesting Biography of Dr Graves in the Dublin University Magazine for Feb. 1842, p. 260.

most prolific bed ;—keep them covered with water ;—in fact, make lakes of them,—they are harmless ;—but as soon as their edges or other parts begin to dry they become pestiferous, more or less so, exactly in proportion to the degree of ventilation they enjoy.

It is the undoubted offspring of elevated temperature long continued, and whenever that temperature cannot be had, malaria has no existence. Yet is there something more in malaria than caloric or the matter of heat. The surface of the sea at earth's lowest level reflects the solar rays with an intensity fully equal to that on land, without ever educing malaria. It was long believed to inhabit marshes exclusively, and that vegetable putrefaction was a never-failing concomitant or source. It is now known that putrefaction has little to do with it, and that marshes or woods, through their rank coverings only, with the infinite variety of surface these present, serve for a nidus and a clothing to the concealed poison, which springs as often from living water and living vegetation, as from corrupting vegetables and putrid dung-heaps. Nor yet is it evaporation alone, as some have supposed, for again the surface of the ocean, that mightiest field of evaporation,—mighty almost beyond imagination to conceive,—is absolutely devoid of it.

Exsiccation does not preclude it, for dried countries that have previously been wet ones are ever the first to prove pestiferous. Perflation is a grand corrector, but will not always dispel malaria. It is, nevertheless, the best we yet know, and its absence is the uniform forerunner of pestilence ; for should perflation, either from the circumstance of sheltering heights obstructing the breeze, or vegetable coverings preventing it from sweeping the earth's surface, become impossible, malaria will accumulate, and spread disease and death around. Of the foregoing positions I shall now proceed to offer some illustration and proofs.

It is febrile malaria alone we have to do with here, and this is a production altogether of the warmer latitudes ;—in the colder it is unknown. Wherever it can exert its influence, fever is the product, and the type of fever can be measured pretty accurately, according to the ascending (or descending) scale of the thermometer. Generally speaking, intermittent fever rarely occurs when the summer temperature is under 60°, the remittent under 70°, and the higher concentrated fevers, amounting often to what has been called yellow, under 80° of Fahrenheit's scale.

All these are clearly fevers of malaria, never contagious in themselves, and always extinguishable on reduction of the temperature that produced them. That water extinguishes malaria, and that the depths of the sea do not contain it, we have some familiar evidences, without going far to seek.

In the year 1810, a magnificent British host was sent to the mouth of the Scheldt, and took possession of the Island of Walcheren, with its adjunct South Beveland, and others. It was in

the early autumn, after a hot summer, and for a short time the troops were healthy ; but malarious fever soon appeared amongst them, and assumed an epidemic pestilential current. The sickness continued unabated during the whole autumn, and inflicted a blow upon the British army, which it did not recover during the remaining part of the war, but the naval portion of the armament felt nothing of it. It was the most extensive and best appointed that could be furnished by the country, and its ships begirt the islands occupied by the troops, lying often within pistol-shot of the shore, but wherever water interposed, it proved the girdle of safety. While the troops were dying by hundreds of the malarious fever, it never entered the ships lying so near, provided their crews slept afloat, and had not been on duty ashore. Upon a fact of this kind, so well established, the mind may safely repose. It cannot be controverted, and to seek farther proof on that point would be a work of supererogation. We may safely, then, assume it for a basis on which to build a superstructure of evidence that may, at some future period, disclose the true nature of malaria. Be it remarked, moreover, in corroboration of the agency even of terrestrial water, that eleven years previously we had sent to the same country at the same season of the year another hopeful army of the finest men who suffered, I may say, nothing from malarious fever. The preceding summer had been wet and cold, almost to an unexampled degree, and the land, under a low temperature, was everywhere much flooded. The troops consequently suffered all that exposure could inflict upon the inhabitants of the bivouac, with the exception of the endemic fever of the country, for, amidst wet and cold, malaria could have no place.

In a former part of this work, I have stated that while at Cape St Nicholas Mole, St Domingo, the newly arrived troops were all but extirpated by yellow fever, the cruising squadron, manned with crews equally strangers to the climate, felt little of the sickness, and I added, or should have added, that fleets, while they kept the sea, were never unhealthy, even in the hottest climates, except from some internal but rare factitious malaria, generated within their own wooden walls, and never, by any possibility, arising out of the element on which they rode.

Does any one require evidence of malaria being altogether terrestrial, he will find it wherever the thermometer can be made to stand firm within the elevated degrees that elicit intermittent out of the marsh in Europe ; remittent out of the jungle in the east ; and yellow fever from the tropical unventilated savannas, and the becalmed leeward bases of mountains in the West Indies. He will find farther, that so strictly is it telluric, a perpendicular brick wall has been known to stoop its current ; that the inhabitants of the lower story of a building will be affected in a double, or even triple ratio to those who reside in the upper ;* that it will adhere to the

* This was most remarkably exemplified at Walcheren.

earth's surface, climbing through its attraction there even to the mountain tops, within a given elevation above the marsh, from thence to dip or drop upon the habitation on the other side ;* and more especially where hollows, that cannot be swept out by the winds, intervene, accumulating there into force capable of producing the most exalted pestilence. Is this or any part of it denied ? See Gibraltar, during certain peculiar seasons of drought, concocting yellow fever in the elaboratory of its ravines and becalmed leeward base, or Cadiz doing the same behind its ramparts, obstructing ventilation, or the strongly fortified Havannah, actually embosomed in fortification, never free from it ; or Seringapatam in the east, from the same cause, falling into the same predicament. I mention these places merely from their being prominent in our history, and well-known ; but every walled town exhibits more or less the same morbid influences, and must do so for as long as the thermometer stands high, and the breeze is obstructed. It will be the inclosing rampart, however, that does it ; for great open towns in malarious countries prove often the cities of refuge from malaria.

For proof that malarious fever arises out of the drying process, view malarious Spain in the autumnal season. It would be difficult, then, to find in any part of the world a more unhealthy country, and it has been so ever since the days of Julius Cæsar, " who had a fever when he was in Spain," of an intermittent or remittent type. The poet does not exactly tell us when ; but we may presume that it was in the autumn, for it is then when the streams cease to be streams, and are no more than detached pools in the lines that had formerly been running waters ;—when vegetation has disappeared from the surface, and ditches, pools, and marshes are all dried up, that pestilence arises to stem the might of armies. Spain, beyond all doubt, though as prolific of endemic fever as Walcheren, is, then, the driest country of Europe, and it is only when she has been thoroughly wetted by the periodical rains that she can be called healthy, or even habitable with any degree of safety.

Marshes are neither its only nor its most dreaded habitation. The lesser degrees of malarious fever unquestionably spring from the swamp and from the top of the brimming but decreasing ditch, the higher from its dried or drying bottom, and the drying country, wherever situated.

* Of this I gave some notable proofs from my Inspection Reports of the West Indies, in a paper that was read before the Royal Society of Edinburgh in the year 1820, and afterwards published in their Transactions, wherein I showed that, though the marsh may be the elaboratory of the poison, its favoured roost or point of concentration is the elevated ground in its own vicinity. Plunged into the first, as at Demerara or Trinidad, it has been found possible for Europeans to live unscathed ; but very seldom, I believe, on the mountain side, or even the mountain top, within a given elevation. The covering heights of Port of Spain and Trinidad immediately above the great eastern marsh, were the most pestiferous conceivable, and a rocky shelf or recess high up on the inner Cabritte Hill of Prince Rupert's Dominique was found to be uninhabitable from malaria.

Ague and yellow fever (concentrated remittent,) although belonging to the same family, are not usual concomitants. They do not ordinarily inhabit together, and wherever in hot countries the former disappears in dryness, it is a sign that the latter is about to take its place. The driest spots in the world, such as the leeward shores of Martinique and Guadaloupe, or the base of Gibraltar Hill, are then the most pestiferous, and ague will not reappear until the surface has been again thoroughly drenched and chilled with rains. Should the heat of the climate preclude the latter predicament, the first approach to exsiccation will establish the higher grades of fever, but without the smallest reference to or connection with putrefaction, aqueous or vegetable. Of this the most ample proofs could be seen at Guadaloupe, in the course of a short ride from head quarters. The leeward shore to the south of the capital, for a course of near thirty miles, ran along the base of a high unbroken mountain ridge, that, rising like a wall to the height of more than 2000 feet, utterly becalmed the beach, and repelled the sea-breeze as a dam repels the current of a river. The beach was in many places as clean sand and gravel as ever was seen; in others, but not so many, marshy; both, however, were most pestiferous; the first if possible the worst, although evincing nothing of putrefaction as cognizable by the smell. The pestilential character of the driest spots exceeded anything I ever knew, and one of these (Bouillante,) a deep mountain-basin of the cleanest and purest sand, might have served for the habitation of the far-famed upas tree, with its fabled poison.* Such was the scentless country. At Point au Pitre, on the other side of the island, we had wet marshes in abundance, smelling most offensively, and in the midst of these that commercial capital was situated. When the marshes were flooded, it might actually have been esteemed a healthy place for a West India town, and when they smelt strong it was not at its worst, but when in dryness, it or its garrisoned outposts ceased to smell, it was then as dangerous and deadly a quarter as any on the face of the earth. I have inhabited it at both periods, and during the first have been annoyed even to disgust by the fœtor while walking the streets by day, and still more

* On the last conquest of that island by Sir James Leith, I was the principal medical officer, and thought I had secured most excellent accommodation for the wounded in the attack of the capital at the negro village of Bayliffe, on the first ascent of the leeward mountain ridge. The soil was red, hard, dry, and ferruginous, and a cleaner or a healthier spot apparently I had never seen. The coloured people immediately got about us, declaring in their negro French, we should all be destroyed by fever if we remained there, for it had always proved *le tombeau des blancs*. At this we laughed, attributing the information to their desire to get rid of us; but concentrated remittent fever appeared among us the very next day, and my friend, Staff-Surgeon Kerr, one of the best seasoned medical officers in the West Indies, who, for a course of years, had withstood the most concentrated miasma of St Lucie without a headach, fell one of the earliest victims. It was then for the first time I began clearly to understand how dryness and cleanness where ventilation was wanting could be no safeguard; that vegetable putrefaction was, under such circumstances, a delusion; and that the base of Gibraltar Hill, Barcelona, and others might, in some particular seasons, become as pestiferous as the negro village of Bayliffe in Guadaloupe.

offensively when in my sleeping apartment at night, without experiencing or observing any increase of febrile sickness.

Such, too, was the case not less remarkably with the deep extensive Bacolette swamp of Tobago. When inspecting the barracks and hospital of Fort St George, situated directly to leeward of it, the smell has been so offensive, that I could scarcely go on with my duty; but there had been no fever worthy of notice amongst the troops for many months, and all around was health. I had occasion to notice the very same occurrence of putrefaction and smell without accompanying fever at New Amsterdam, Berbice, in all which instances the hydrogenous portions of the decomposed water must have been diffused far beyond their bed; and when we compare the same results springing out of the purest and cleanest sand and the foulest marsh,—when we see the direst pestilence arising out of the cleanest ravines or the dry unventilated bases of hills, such as the yellow fever at Gibraltar, who can say that malaria is putrefaction, aqueous or vegetable, singly or combined. It is neither the one nor the other. It is a terrestrial poison of hot climates, with which every unreclaimed and unventilated country must be replete, and man alone can war against it by cultivating and draining the soil, and building cities, the interior of which, more especially if they be large, is, generally speaking, proof against it from without; and for this reason it is that great and open towns, until they begin to decay, have generally been found comparatively healthy. This is the case with few exceptions.* Let him halt in the work, and presently the enemy from without is upon him, pressing him back from stage to stage, and reoccupying the ground, until at last he is driven from the land. Read the history of ancient Rome, and compare her greatness then with her present state,—the mightiest metropolis the world ever saw,—her very size securing health within, and population, necessarily inferring cultivation, insuring the same result beyond the walls. Now see her and her territories, with the population going or gone, fast becoming one vast field of malaria; or view, on the other hand, our own Calcutta,† rising, almost within the memory of man, from an obscure fishing hamlet amidst the swamps of the Ganges, into a mighty city, building out the malaria, and sending before her as she expands, the pioneer of cultiva-

* The health of great towns may be said to be regulated by moral more than by physical influences, of which last they are in a great degree independent. The principal exceptions that occur to me of this are the great towns of North America and Southern Spain, in certain unhealthy seasons generating yellow fever, and those in the Upper Levant generating the plague, but even these last may be classed under the above general rule, as it is their defective police that favours the spread of pestilence: for the European factories, where due precautions are always observed, rarely suffer.

† This is more applicable to the state of Rome as it was twenty years ago than to her present condition. Since then, and, indeed, ever since the continent was opened at the peace of Paris, capital and population have flowed into the city, and should the stream continue uninterrupted, she may again resume much of what she has lost, just as certainly as she will relapse into deterioration when the stream fails.

tion into the neighbouring jungles; but let her once recede or even halt in the course, and the occult enemy will reappear;—her palaces will presently become his abode, the worse from being ruinous, and the powers of pestilence driving her inhabitants from the outer environs back to the centre, will at last cause her to sink into the same malarious den from whence she arose. Such, too, will be the fate—the speedy fate—of the beautiful West India town, Port of Spain, Trinidad, whenever she ceases to build and to cultivate.

Cultivation always and necessarily implying population, becomes all-powerful against malaria, of which, again, in the western hemisphere, we have another beautiful illustration at Demerara, where the seaward border of the swamp which I have elsewhere described in general language as the swamp of 1000 miles, (for it is deep, vast, and immeasurable,) has been converted into a habitable and beautiful settlement, as rich as any in the world. A Dutchman alone could have ventured to begin such a work, and through the negro's hand he has actually accomplished it.

We may say, then, that malaria is universally diffused throughout all hot countries, wherever ventilation is wanting or water dried up. It is powerful only during the night, and is certainly dissipated, or at least rendered much less active by the light and heat of the sun, in as far as any one given day is concerned; and, indeed, were I inclined to speculate, I would say that light as a disinfectant was, more than anything else, the antidote, and that a deep dried-up well, which had ceased to be a spring of water, would certainly become a spring of malaria. Its tenacity of place however, is one of the most remarkable features; for, unless the malarious field be large, its range is singularly limited, being often confined to one side of a street, to one story of a house, and above all, to umbrageous trees, from which it is so difficult to disengage it, that the inhabitants of Dutch Guiana have ventured to construct their habitations, and that with impunity, provided they have this security,—immediately to leeward of the most pestiferous swamps.* Hence it is that the close-matted jungles of the east, where the winds cannot enter to purify, prove so incredibly pestiferous from the retention of malaria after rains. While the rain is falling, and during the rainy season, they are refreshed, but when once they begin to dry, there arises a low cloud of malaria on the ground, which, detained there impervious to the sun's rays by the covering vegetation, proves deadly to all who repose within its influence.

It is fair to presume that it is heavier than the ordinary air of the atmosphere, for it creeps along the ground, and is singularly

* When I was last in the West Indies, I recommended, and, if not done, recommend still, that the deep marshy isthmus outside the post of Prince Rupert's, Dominique, from which it was believed to derive its malaria, should be covered with the closest growing trees, and that the brushwood covering the landward face of the inner hill, which had so carefully been cleared away, should forthwith be restored.

concentrated and attracted by the higher grounds immediately above the drying swamps where it is generated. It lodges in the angles and ditches of fortified lines, and lurks in the nooks and hollows of walled towns; but the pavements of these last are the best defence against it, and an unbroken extent and succession of these, without confining walls however, confer the best security that towns can give, for all which, if there be a remedy, it must be found in the powers of cultivation ever opening the surface for the escape of pestilential gases, and exhausting the morbid principle by a constant succession of crops; for, wherever malaria prevails, the uncultivated savannah, even though used for pasture, becomes more unhealthy than the plantation, and the depopulated country falls completely under its dominion.

That clayey soils, more than any other, should in Europe be found the site of ague through their retaining moisture near the surface, is explicable from that circumstance; but that sandy soils should in malarious climates prove as productive of aggravated remittent fever as the swamp, has never been sufficiently explained. Certain it is however, that they do so in a marked and prominent degree. The Alentejo and Algarves of Portugal,—regions, I may say altogether of sand, are the most prolific of fever of any in the peninsula. The sand hills and sandy plains of the low countries gave us as many intermittents and remittents as its fens. In the southern states of North America, the sandy provinces, such as South Carolina, are noted for the early invasion and severity of the endemic fever, and some sandy quarters of the West Indies, such as Granville Bay, Grenada, were the most pestiferous I ever examined. This is strange, for the particles of sand can hold up no moisture to evaporation; the soil is open, in regard to water, almost as a sieve, and if what I have written in the foregoing be well founded, malaria should have no place there; but it has a place. Cross the river at healthy, rocky, but dirty Lisbon,—there, little more than two miles broad; and amidst the dry, clean sands of the Alentejo, you are plunged at once into malarious pestilence. Ascend the stream upon the southern shore, it is every where the same; halt at Salvaterra, (a favourite hunting-seat of the royal family,) and if it be the autumnal season, you will find a squalid, bloated population, dying amidst seas of sand, that when I was there appeared almost to bury their habitations. This constitutes one of the puzzles to which I alluded at the opening of this subject. It seldom, almost never rains at the season of disease, but why the dried sands on the southern side of the river should not prove as healthy as the dried rock, which constitutes the foundation of the soil on the other, has hitherto confounded the theorist, and defies his research.* In these lands there is nothing to ob-

* Does it depend upon the depth of soil in the unhealthy country, compared with as thin shallowness in the other? The Island of Malta, which has been likened to

struct ventilation, no more than there is at Up-Park, Jamaica, or well cleared Barbadoes. Thick woods do not exist, all is open and clean. Why, then, are they pestilential? Cape St Nicholas Mole was the same when we first landed at St Domingo, but there the whole country was jungle. Unless there be a poison in sand, which there is not in the harder rocky soil, it will be impossible to account for it. Vegetable putrefaction will never help us out of the difficulty, for vegetation is no common product of the sand-bed, and after all where is the element of disease? Is it to be found in the fallen leaves of the living ever-green woods of the Tropics? They are thinly spread out to decay, or dry as they fall, and cannot be collected in corrupting heaps; but collect them in heaps, say for manure, would they then prove pestiferous? It is well known that they have no such effect. Will aqueous putrefaction explain it better? The swamps of Point au Pitre, Guadaloupe, and of the Barcolette, Tobago, as well as many others, respond in the negative; for in all these the azotic hydrogenous portions of the decomposed water, as was proved by the smell, had extended far beyond their bed. Should they be held in affirmative reply, we must then allow that the bilge water, with which the hold of every ship in the world is more or less impregnated, would convert vessels of every kind into huge chests of malaria; but are their crews so affected? They are generally, while they keep the sea, the healthiest set of men in existence; but let them remain on shore after nightfall in any uncleared tropical country, and fever will straightway claim them for her own. Our surveying ships, healthy till then, are every day in such lands leaving the corpses of their crews to prove the right of occupancy. The unreclaimed, the relapsed surface, will everywhere prove equally dangerous. It is there the poison resides as clearly and decidedly as in marshes and swamps. I cannot tell what it is, but if I can tell what it is not, the way will be cleared for a better creed, and future investigators may disclose the secret which has hitherto baffled the keenest and most indefatigable inquirers. Like the poison of typhous fever, its strength lies in accumulation; for give entrance to the winds, and while they blow freely from healthy quarters it is gone.* Let them cease, as during night calms, or unwholesome land winds, malaria will resume her sway.

The incubus of vegetable putrefaction has lain upon the mind for ages, and one wonders how so baseless a theory could have kept

a great stone quarry, says yes! and one newly acquired post of Aden on the Red Sea, I believe bears testimony to the same. Rock of itself, whatever be the temperature, is, in fact, as devoid of malaria as the surface of the sea.

* Sojourners in malarious lands can bear testimony that a walled garden has been found full of malaria, which ceased to be so, as soon as a hedge pervious to the breeze was substituted for the wall, or that gratings in it so placed as to create a thorough draught, had partially the same effect.

undisputed possession so long. The vegetation of marshes is ordinarily in an active living state, which, from the accompanying moisture, must continue so, longer than under any other condition. Like everything else that lives, it must have its decay, but that will be conducted in portions, and by degrees, seldom, I may say never, presenting such a mass of corruption as we daily see in the fermenting dung heap, or fields of putrefying vegetation.* Who has not smelt these, and who will assert that he ever knew of fevers of type resulting from them; but why vegetable putrefaction alone, to the exclusion of the animal, by far the most obvious and offensive of the two? This last has had its advocates, but now they can so easily be led or referred to the healthy abattoirs of Paris, to the preparers of catgut, the boilers of glue, and all such horribly stinking trades among ourselves, that they must be silenced. The evolution of carburetted hydrogen from concentrated putrefaction may be so powerful as instantly to asphyxiate the bystander, and extinguish life,† but never to produce plague with its buboes, nor regular typhous fever with its low and slow, wandering delirium, nor the intermittent, the remittent, or the yellow; yet did the powerful mind of the enlightened and humane Dr Rush of Philadelphia at one time conceive the idea (though he afterwards came to know better) of a yellow fever which pervaded that city in common with the whole sea board of the Southern Atlantic States, having been occasioned by the exposure of some damaged coffee on its wharves. Yellow fever, as we have often seen, will, while the temperature and the atmosphere favour, arise as readily out of the soil of clean and cleared Barbadoes as out of the densest jungles of Demerara or Trinidad: as well from the clean base of Ascension Hill as out of the accumulated alluvia of the African rivers. Grant the above conditions, which have so often been proved in our fleets and armies, and then we shall see that fevers of type must always have either an endemic or an atmospherical origin. Contagion, in

* Putrid cabbages and decaying turnips, or such like.

† The most abhorrent of all putrefaction is that human putrefaction arising from the gorged churchyards of our metropolis and other great towns. The degree in which it has accumulated in almost all of these, is a disgrace to the age in which we live. It poisons the atmosphere of their vicinities with the never-ceasing stench, and excites disgust often even to nausea amongst those who are obliged to reside within its influence; but does it produce fever, either typhoid or of any other type? If it did, our grave-diggers, always as healthy as their drunkenness will permit, would require to be renewed by annual or even monthly relays. The surrounding streets would long since have been rendered uninhabitable, and the nuisance would have cured itself. No one can deny that it must deteriorate the health, and, in consequence, shorten the lives of their inhabitants, but it afflicts them with no peculiar fevers, for these streets are never worse or so bad as others that have become overcrowded, without churchyards in any way within their ken. The stowing away of the dead in vaults, or in any way keeping them above ground, instead of interring them deep in the earth, is an abomination of the Christian world, and ought to be made punishable as a misdemeanour. The Turks, and, I believe, all the nations of the east, utterly repudiate the practice, and it would be well if the self-applauding inhabitant of London would in this respect, at least, condescend to take a lesson from his brother citizen of Smyrna or Constantinople.

the first instance, can never be the source, but, as occurs in the plague and our own typhus, may afterwards become one of their attributes. It is impossible, however, that fevers arising from malaria can be so endued, unless, as we have lately seen, in what was called the Pali plague of Upper India, through accumulations the most foul, and neglect of the decencies of life the most culpable.

To the landsman, and more especially the soldier, whenever obliged to inhabit malarious lands, I would say, move and keep moving, as soon as fevers appear, but always to the open and windward, never to the sheltered side, for it is there precisely where the poison nestles. Malaria is an unwilling traveller, much attached to his den, and 'tis odd she will not follow long or far. If obliged to remain on the spot, construct a habitation, well raised above the ground on wooden pillars, with the air circulating underneath. To the seaman, keep the sea, and, when thrown into unwholesome anchorages, shun the shore after nightfall. The duties of watering in all uncleared countries of high temperature have ever been most fatal, for the attractive flowery dell has too often proved the abode of death, and the music of its waterfall has lulled but to destruction. These duties, however, can always be conducted with safety while the sun is above the horizon. Malaria has then no power; he is an earthly and a nightly demon, and his deeds on land are deeds of darkness. But let me not in all the foregoing fall into one-sidedness of argument; for special pleading, in any way, can only tend ultimately to mar the cause it was meant to uphold. Is the act of sleeping, when every fibre is unstrung, and the prostrate frame is offered up to become the food of malaria or anything else, the danger; or is it merely a condensation of the poison during the cold of the night, that thus causes it to manifest its effects as soon as the sun falls below the horizon? I conceive that the first query is answered by the fact, that throughout the south of Europe, and, indeed, in all hot countries, the middle hours of the day are spent in sleep. The siesta is taken with open doors and windows in the verandahs, or on the roofs open to the breeze, without the inhabitants having the smallest conception that danger can arise from the practice. At night, when they have fear, all is shut up, and the moon-beams, above all, are excluded with the greatest care. Is it then the dews of the night that bring malaria? But these fall as heavy on the deck of a ship at sea, where it has been shown there can be nothing of the kind, as they do in the most confined valleys of the land. Or is it solely a difference of temperature between the night and the day? This may be a cause in some regions, but it is not so in the Arabian deserts where, before sunrise, the thermometer descends to nearly the freezing-point, or in some quarters of India where,

with a little assistance, ice can actually be obtained in the early morning at stations where it rises above 80 in the middle of the day. What is it then? It is malaria. In the present state of our knowledge, we can make no more of it. It gives no warning of its presence. Our senses cannot be made to comprehend it, and chemistry has failed to detect the secret. The poison is peculiar to certain soils and subsoils, yet ill understood, and affects the superincumbent atmosphere only in a secondary and superadded degree. It is a quality of the earth's surface, but that quality is one of nature's arcana, which science has hitherto in vain attempted to disclose.

ART. V.—*Dislocation of the Humerus forwards beneath the Clavicle, occurring in bed during Puerperal Convulsions and Delirium.* By ARCHIBALD DYMCK, M. D., F. R. S. S. A., Senior Surgeon to the North-Western Dispensary.

ON the forenoon of the 17th of January, (being exactly the 275th day after marriage), I was summoned to wait upon Mrs Telford, aged 23, a robust and handsome woman, then seized with labour-pains at the close of her first pregnancy. Though no more than an hour and a-half had elapsed from the earliest indication of approaching parturition, the dilatation of the *os uteri* already exceeded a couple of inches; the head was presenting; the passages were soft, cool, and well lubricated with muco-albuminous secretion, and, excepting a brief interval of ungovernable frenzy which accompanied the act of crowning, and the exit of the head, the case advanced steadily and naturally to its termination. The issue was a vigorous male child of full size and proportions.

At the evening visit, and about six hours after delivery, I left my patient going on favourably; but I had scarcely reached my own door, when I was overtaken by a messenger in breathless concern, who anxiously urged me to use all speed in returning, as Mrs Telford was considered to be dying. I forthwith hastened to her house, along with my friend Dr Jackson, who chanced to be with me at the time, and there witnessed a very altered and alarming state of matters. Shortly after my previous departure, and at the moment of applying the infant to the breast for the first time, she fell into a strong convulsion, which lasted for some minutes, and out of which she gradually passed into a condition of wild and furious delirium, such as we found her in. The face was intensely flushed; the eyes suffused; the countenance full of terror and apprehension; the pulse full, strong, and above 120;

the raving, and the frantic efforts to raise herself in bed against the restraint of four or five women, incessant. The determination to the head was too well marked to admit of hesitation, and having, therefore, fixed the right arm with considerable difficulty, we drew from a large orifice about thirty-six ounces of blood, when faintness supervened. On her revival from this temporary depression, we were glad to find that, with a decided abatement both in the strength and frequency of the pulse, there was also a complete removal of the delirium. She now only complained of pain in the head and the left arm. As the bowels had been sadly neglected before confinement, it was deemed highly essential, first of all, to exhibit an effective purgative. The pain of the arm, as supposed to be the consequence of a strain received during the violence of her struggles, was now overlooked as an affair of minor importance.

In the course of two hours, thereafter, I saw her again, and was informed that there had been neither renewal of the convulsions nor delirium. She still, however, continued to make much complaint of the arm, and begged to have it rubbed. More, therefore, in compliance with her wish than from any serious notion of injury, I laid my hand upon the elbow, to which she principally referred the pain, and using a little gentle friction, cautioned her to remain quiet, with the assurance that, as it was but a trivial bruise, the uneasiness would speedily pass away.

The next morning I found that she had remained free from any recurrence of the symptoms of the preceding day, but she had not slept from the constant pain in the arm, of which she now complained most bitterly. I accordingly proceeded to institute a minute local examination, in order to discover a source of so much painful discomfort. Placing my fingers upon the elbow, and by degrees moving them upwards, I recognized no trace of deviation from the natural condition of the parts, until my hand rested on the shoulder, when, to my inexpressible amazement, I detected the glenoid cavity of the scapula to be empty, and the head of the humerus lying in front, a little below the margin of the clavicle. I needed no further enlightenment to account for the torture experienced in the extremity; but, that my patient should have the benefit of the best surgical assistance, I lost no time in procuring the attendance of my friend Dr Duncan, surgeon to the Royal Infirmary, who soon afterwards succeeded, but not without the employment of a great extending force to the forearm, in replacing the bone in presence of Drs Jackson and Newbigging.

The foregoing narrative is curious and instructive. It is curious, because it stands very prominent,* perhaps alone, as an evidence of the prodigious increase of muscular power that may be

* Professor Simpson informs me of a case of dislocation of the jaw under similar circumstances, during delivery.—Vide *Med. Cour.* Vol. ix. Case by Fielding Best Fynney, Esq.

elicited during those remarkable changes in the system which are at times the concomitants of parturition. Doubtless, it is not to be regarded as an instance of spontaneous luxation directly, and wholly dependent on excessive muscular contraction, because the natural disposition of muscles, ligaments, and tendons in the neighbourhood of joints, is such as to allow of powerful exertions with perfect security against displacement. But when it is remembered that before my arrival the patient had once successfully gained the sitting posture in spite of the attempted coercion of several women, and that, when her person so disposed was rather turned to the left, and the arm partially raised from the side, she dashed herself back in an ecstasy, the elbow first coming into contact with a hard straw pallet, thinly covered by a chaff dressing,—there can be no question as to the tremendous muscular energy in active operation, which not only dislodged the bone, but drove it to an unusual distance from its natural connections.

But the case is likewise instructive. Here we have a young and plethoric woman, who, notwithstanding repeated warning, persists up to the last hour of utero-gestation in neglecting to regulate the state of her bowels. Happily she escapes, during the immediate performance of the function of parturition, the development of any of those morbid phenomena so often associated with deranged states of the *primæ viæ*, and which add so formidably to the trying and perilous ordeal of a first child-bed. The tendency, however, had before discovered itself when her reason yielded for a short time prior to the birth of the head. The risk remained as it were only in abeyance. The few hours of unbroken slumber, enjoyed after the delivery, constituted a mere period of immunity from the effects of external and internal impressions. The very first cause of excitement, the initiatory trial to suckle the infant, with the instinctive mental emotions attending it, was sufficient, under the circumstances, to interrupt the general harmony, and to set in movement the train of abnormal events which we have indicated above.

19, Pitt Street, Edinburgh,
28th January 1843.

ART. VI.—*Observations on the Mal d'Estomac or Cachexia Africana, as it takes place among the Negroes of Dominica.*
By JOHN IMRAY, M. D., Licentiate of the Royal College of Surgeons Edinburgh.

I. *Causes.*—*Cachexia Africana*, dirt-eating of the English, *Mal d'Estomac* of the French, is a disease peculiar to the negro.

racés, and formerly was extremely destructive amongst the black population of our West India colonies. Bryan Edwards, in his History of the West Indies, says, that, in his time, the greatest mortality amongst the negroes arose from two diseases, *trismus nascentium* and *mal d'estomac*. The former disease is still very frequent and fatal among children, but the latter, for years past, has been gradually disappearing, and at the present moment but few cases are to be met with, at least in this island.

The extinction of this fatal malady may be traced to several causes, but is chiefly to be attributed to the greatly ameliorated condition of the negro in a physical as well as moral point of view. It is also to be considered that the Africans, imported from their own country, who were generally the subjects of the disease, have been almost entirely replaced by a native population with the feelings and habits of civilized life, and looking upon the country which they inhabit as their home. Among the causes that have usually been enumerated as giving rise to *mal d'estomac*, were distressing mental affections, ill treatment in various ways, as labour carried to excess, scanty and unwholesome diet, insufficient clothing, bad lodging, &c. While the slave trade existed in our colonies, instances of negroes sinking into an irremediable state of despondency from being torn from their own country, and consigned to hopeless slavery in a strange land, were by no means uncommon. This state of mental depression but too frequently led to the habit of earth-eating being formed,—either as a consequence of disorder of the digestive functions, or the ingestion of earthy substances was resorted to as a poison* in order to get rid of existence. Of late years it was generally observed, that negroes affected with *mal d'estomac* were ill-disposed and indolent, addicted to sexual excesses, or the immoderate use of rum, while their diet at the same time may have been scanty and irregular from neglect of their provision gardens.

The baneful effects of the superstition of Obiah afforded many examples of the powerful influence of strong mental emotions in producing bodily disease and death. The moment a negro was led to believe that an “Obiah man” was practising his spells upon him, he gave himself up as lost. The slightest ailment was converted by the imagination into serious disease, and the health gradually gave way. One of the most frequent consequences of this state of the mind was such derangement of the digestive func-

* In the time of slavery this often occurred from annoyances sometimes of a very trivial nature. A French planter, on whose veracity every reliance could be placed, informed me, that, on the estate of his family in Martinique, this disease for many years was scarcely known, until the negroes, for some reason, formed a strong dislike to the manager. *Mal d'estomac* then broke out amongst the people, and in one year thirty died. The manager, at length perceiving the cause, left the estate, and from that period no other case afterwards appeared.

tions as laid the foundation of incurable *mal d'estomac*. This miserable superstition is happily more a subject of derision than dread to the comparatively enlightened negro population of the present day. There was every reason, however, to believe, that, when the incantations of these "Obiah men" failed, they had recourse to the more certain method of poisoning to effect their wicked ends. It was well known that most of them were skilled in the use of the active vegetable poisons of the country. Cases were sometimes met with whose origin could only be attributed to simple derangement of the digestive organs, unconnected with any mental affection. A well-conducted negro, comfortable in every respect, and subjected to no harsh treatment, with his provision grounds in high cultivation, furnishing a superabundance of food, would be observed to lose his health and strength and become altogether changed. On minute inquiry into the symptoms and history of the patient, the cause of this alteration in his habits and loss of health could be traced to his having contracted the unhappy habit of earth-eating. Nearly the same causes gave rise to the malady in both sexes. Young women who were subject to *mal d'estomac* were frequently found to have been dissolute and irregular in their habits,—such as indulging to excess in dancing during the night, promiscuous intercourse with the other sex, &c. The passion of jealousy should also be mentioned as predisposing to the disease in both sexes. Occurring about the period of puberty, its resemblance to chlorosis was very marked. With young women obstruction or suppression of the menstrual discharge was almost always one of the first symptoms spoken of, and so constant an attendant of the complaint, that at first view it might be considered as the primary cause, or at least intimately associated with it.

On those estates where the negroes had been long settled, *mal d'estomac* prevailed less than on properties where the people had been recently collected together from different parts. It was the invariable custom of the planter to furnish negroes, newly located on his estate, with an extra allowance of food and other necessities for twelve months or longer, to allow time for provision gardens to be established. If the negro, from incorrigible indolence, discontent, or other causes, neglected cultivating his garden, when thrown on his own resources, an insufficient supply of food led to his contracting the habit of earth-eating.

The greatest proportion of cases was always found on sugar estates, and principally in those situations considered unhealthy. On some estates it seemed to prevail almost as an epidemic, for the kindest treatment and ample allowances of food had no effect in preventing the disease from spreading, and producing its usual fatal effects. That *mal d'estomac* was contracted when the mind

could in no way be instrumental, was evident from the fact of children being affected at so early an age as five or six; and amongst them it often extended as if by contagion, or the habit seemed to be acquired by the mere force of example.

Negroes removed from coffee to sugar estates were not uncommonly the subjects of *mal d'estomac*, induced, no doubt, by separation from old friends and associations, as well as the change to labour of a more severe character in a climate much less healthy than that of the coffee estates; the latter being situated on the tops and sides of the mountains,—the sugar properties in the valleys below.

II. *Symptoms*.—*Mal d'estomac** is generally of long duration, and while in its incipient stage, often passes unnoticed for many months, suspicion being first excited by the change in the temper and habits of the patient. If naturally lively and active, he has become low-spirited and listless, and seeks solitude in preference to the society of his friends. His usual amusements lose all attraction for him. Averse to any exertion, either for himself or master, he performs his work in the most indolent and slovenly manner, regarding with heedless indifference the reproaches of his fellow-labourers. His provision gardens, which formerly he took pride in cultivating, are neglected, and soon totally abandoned. Being thus deprived of a regular supply of wholesome food he is compelled to trust to the charity of his friends for an uncertain and scanty subsistence, or to allay the cravings of his stomach he resorts more frequently to the clay or earth he is in the habit of eating. The particular description of this substance he prefers, is often sought for at a great distance, and a quantity sufficient to last for a considerable length of time is carried away and carefully concealed, a supply for the time being drawn from this hoarded treasure when an opportunity offers of eating it alone. Unable now, from increasing debility, to perform his accustomed labour, and perhaps suffering from want of food, the miserable patient is a frequent visitor in hospital; but by the symptoms only, and these are strongly distinctive, can the disease be detected. So far is he from being brought to confess the real cause of his illness, that even when the clay which he has been eating is found on his person, he rejects with the utmost pertinacity the charge of being addicted to earth-eating.

* The disease is described as it existed during slavery and the "transition period" of the apprenticeship system. Each estate was then provided with an hospital, whither the negroes were sent when ill. A supply of medicine—the nourishment, wine, and other necessities considered requisite by the medical attendant, was furnished by the proprietor. On the few estates that now receive regular medical assistance, the people prefer remaining in their houses when sick. The mass of the population in this island is at the present moment wholly without medical aid, a few humane proprietors only continuing to furnish their properties as formerly with medical assistance. Incalculable as are the advantages the negro derives from freedom, his condition in this respect is by no means improved, so far as the colony of Dominica is concerned.

The complaints made at first are usually of a fixed pain at the seat of the stomach, and sometimes in the cardiac region, shortness of breath increased on the least exertion, weakness of the limbs, and beating of the heart. The tongue has a whitish covering over all its surface, the mucous membrane of the mouth and lips having the same pale exsanguineous appearance, and by this alone, when the negro has come to hospital from some other cause, the existence of the disease may be determined. As the disorder proceeds, the countenance becomes bloated, and the eye glassy, the conjunctiva, lips, palms of the hands, and soles of the feet are unusually pale. There is headach, giddiness, and dimness of vision. The pain in the cardiac and epigastric regions is constant, but at times much aggravated. The pulse is quick and thready, or full and soft, varying in quickness of beat at different periods of the day, but always accelerated by any exertion. The throbbing of the heart and large blood-vessels is sometimes so violent that the impulse is visible at some distance from the patient. The tongue and mouth, changed to a chalky whiteness, present here and there dark-coloured spots of various sizes. The cutaneous discharge is in a great measure suppressed. So well aware are the negroes themselves of the evil consequences arising from this change, that they often compel their friends, who may be labouring under the complaint, to walk out in the heat of the day under a burning sun, "to make them sweat," as they say, considering, as they do, the free flow of perspiration highly beneficial, and the most certain sign of returning health. The alteration in the appearance of the skin, as well as its functions, is no less remarkable. The glossy jet of healthy gradually gives way to a lighter shade. Yellowish spots are first noticed about the face and neck, and in course of time these extend over the body. The sensation communicated to the feel is harsh and rough, and in the advanced stages of the disease moisture can rarely be perceived on any part of the surface, which, in general, has a dirty, scaly look, partly from the filth which the patient will allow to accumulate on his person, if not carefully watched. The effluvia emitted by the cutaneous surface, at all time disagreeable towards the termination of the disease, is intolerably offensive, differing, however, from the odour of the exhalations evolved by the skin of the negro while in the enjoyment of health. The abdomen increases in size, while there is general emaciation. The state of the intestinal canal varies in different cases. Sometimes there is constipation, at others diarrhœa. The evacuations are very generally of lighter colour than natural, but frequently take the hue of the earth the patient makes use of. The functions of the kidneys are also affected, the urine is clear and colourless, or passed in small quantities, and turbid.

In the wretched state above described, a negro may remain for years, sometimes at work, but more frequently in hospital, his strength gradually failing, until at length he is barely able to crawl about, and if permitted, will lie for hours together under the rays of the sun, in a state of drowsiness, approaching to coma. If nourishment is placed beside him it remains untouched ; all desire for food being lost at this stage, though the craving for earthy substances is uncontrollable. The stomach may be irritable, and food when swallowed almost instantly rejected. There may be considerable febrile heat and excitement. The palpitation and pain in the epigastric and cardiac regions are at times very severe, and never altogether absent. The patient thus continues to sink, and dies extremely emaciated. In most instances, however, death is accelerated by the supervention of dropsy, or of dysentery, peritonitis, or some other acute disease.

Probably the greatest proportion die from dropsical effusion ; at least such is the result of my own experience. The lower extremities are first perceived to swell, the abdomen enlarges, and fluctuation can be detected, while symptoms of effusion in the thoracic cavity are apparent. Under the rapid accumulation of fluid in the serous cavities and cellular tissue, the patient soon sinks, or he dies suddenly from serous apoplexy. A dysenteric attack almost always proves fatal, the inflammatory action of the intestinal mucous membrane terminating in extensive ulceration, or in very acute ending in splanchnitis.

As the disease occurs in women, the close affinity which it bears to chlorosis has been already noticed ; the latter disease, however, is considered as attacking only the female sex, and that after or about the period of puberty, and as arising from derangement of the uterine functions. It is true that a cessation of the menstrual discharge is so common a symptom of *mal d'estomac* in women, that to this cause do they nearly always ascribe the attack ; yet there can be but little doubt that the uterus suffers derangement only in common with other organs, in consequence of the morbid state of the digestive functions ; for in some instances pregnancy takes place when confirmed symptoms of the disease exist. It is also sometimes contracted during the period of gestation, and is met with in both sexes at the early age of five or six. In my own practice I have found a greater proportion of men the subjects of *mal d'estomac* than of women. On one estate it seemed to prevail epidemically. Nearly all the male population were carried off in a few years, while but a small number of women were affected. In this instance it was a matter of great difficulty to arrive at the true cause, for every measure that kindness and humanity could suggest was adopted by the proprietor, in the hope of eradicating the fatal disease from his property.

III. *Morbid Anatomy and Pathological Deductions.*—As

mal d'estomac has its seat in the organs performing the highly important functions of digestion and assimilation, it is to be supposed that lesions of these organs would be discovered on dissection. In all the cases examined, a pale and bloodless state of the mucous membrane of the stomach and intestinal canal was the constant and characteristic pathological change. The lining membrane of the stomach and bowels resembled in colour the tongue and mouth, and was so much softened as to be easily scraped off with the back of the scalpel. The alteration in this respect, however, depended much upon the stage to which the complaint had advanced. If the life of the patient had been cut short by an acute attack of some other disease, the mucous tunic would be found pale, but little, if at all softened. Not the mucous membrane of the digestive passages alone, but often every organ and tissue in the body, presented the same pale exsanguineous appearance; the muscular fibre being pale, flabby, and attenuated; the liver, lungs, &c. undergoing a like change of colour. Ulceration at the pyloric orifice of the stomach, and schirrous thickening and hardening of the coats in the neighbourhood, were occasionally seen, and the mesenteric glands were frequently enlarged and diseased. Worms in considerable numbers were not uncommonly accumulated in the intestinal canal.

The morbid alterations, that were often found to have taken place in the heart, were very remarkable. In some instances this organ was enlarged, and its walls thickened, but in general the muscular substance participated in the change which has been already observed as affecting the muscular fibre in other parts of the body; it was pale, soft, and flabby. On laying open the cavities, polypous or fibrinous tumours were frequently found, differing in appearance, figure, and size in different cases. The mass was sometimes nearly the size of a hen's egg, of a dirty-whitish colour, and covered with a smooth transparent membrane, adhering by many lobes to the *columnæ carneæ* and inner surface of the heart, with which it was continuous. A division of this tumour showed a cellular structure, a thin serous fluid oozing from the cut surfaces. In other instances the concretion resembled in appearance the fibrine of the blood, (of which, no doubt, it was composed,) freed from the colouring matter; the surface irregular, but smooth and shining. This species of tumour adhered still more firmly to the heart, and sometimes sent prolongations into the large vessels; its structure was dense, and required some force to divide it with the scalpel. Again the coagulum was large, soft, easily broken down, and of a greenish hue, somewhat resembling a lump of turtle fat, though less dark in colour. These concretions or coagula were observed in a majority of the cases examined. That many of them were organized, and must have existed long previous to dissolution, seems evident; for it can scarcely be

supposed that, with their firm structure, strong attachments, and investing membranes, continuous with the inner surface of the heart, they could have been formed in *articulo mortis*, or even shortly before death.

The frequency with which these organized concretions are met with in this disease is a point worthy of notice. Many of the symptoms in the latter stage connected with the heart and circulation, as the violent palpitations and hurry of the circulation on the least exertion may, with probability, be attributed to the presence of coagula in the cavities of the heart. May it not also be concluded, that the cachectic condition of the system, and consequent deterioration in the quality of the vital fluid, gives a predisposition to the formation of such tumours? I have had occasion to observe similar concretions in cases where the cachectic habit had existed from other causes than earth-eating, that is, where the fluids were vitiated, the blood thin and poor, the muscular system lax and flabby, loss of strength, paleness of the skin and mucous membranes, and all the symptoms arising from derangement of the functions of digestion and appropriation, which constitute what is denominated the cachectic habit.

The diseased appearances in *mal d'estomac* varied according to the immediate cause of death. With the morbid changes of the digestive apparatus already spoken of, if death arose from apoplexy, then serous effusion was usually found in the brain; if from dysentery, ulceration and sphacelus of the intestines; if inflammation of the lungs, liver, &c., the usual pathological changes.

During the first stage of *mal d'estomac*, there is simply derangement of the functions of digestion and assimilation. In the gradual course of the disease, and by the continued introduction of earthy or other pernicious substances into the stomach, these important functions become more and more disordered, until at length organic change of the mucous membrane of the stomach and bowels is induced. Then follow all the direful consequences of acute disease of the digestive organs. The changes necessary to fit the aliment for its reception into the system are imperfectly effected, while, from the diseased state of the lining membrane of the intestinal canal, the extremities of the lacteal vessels must be so much altered as to interfere materially with the due performance of their functions. Hence the impoverished state of the blood and vitiation of all the fluids, with the consequent emaciation, or effusion of fluid into the serous cavities or cellular tissue. The liver becomes torpid, or secretes unhealthy bile, the mesenteric glands enlarged and diseased. The functions of the skin, of so much importance in the negro, and upon the regular performance of which the preservation of health so essentially depends in a warm climate, are interrupted or perverted, and, no doubt, fail

to exert their depurating effects on the vital fluid. The uterus refuses to perform its different offices. The muscular fibre is pale and attenuated, and, in short, the appearances of defective nutrition are manifest in every organ and tissue of the frame.

The greatly deteriorated state of the blood cannot fail to attract the attention of those who have opportunities of witnessing the disease. The first instance in which I had occasion to abstract blood was the case of a middle-aged labouring woman. The patient, who was not in the last stage, repeatedly requested to be bled, as she said she was sure it would relieve the beating at her heart and in her head. The pulse being full and quick, and very little emaciation, but rather a tendency to effusion existing, her request was complied with. The surprise excited by the appearance of the blood cannot easily be forgotten. When the vein was opened, a thin, watery, light-red fluid gushed with violence into the basin. Its resemblance to claret diluted with water was much greater than to healthy blood. After remaining at rest for some time, a very small, loose, lightish-coloured coagulum formed, which floated about in a large quantity of straw-coloured serum. It really seemed matter of surprise in this case, that, with the vital fluid so singularly changed, and containing so small a portion of nutritive material, the functions of the different organs throughout the body could be carried on, and life sustained. The same disproportion in the great excess of serum does not always exist; on the contrary, the blood is very frequently deficient in quantity, as well as poor in quality. The veins in such cases seldom appear distended, or even filled with blood. The slowness of the venous circulation will be seen when a ligature is applied round the arm, the veins will then be perceived to fill very gradually, and when an opening is made, the blood will probably flow only in drops. In such cases dropsical effusion is much less likely to take place than when the blood is abundant and watery.

It ought to be observed, that cases are met with when the symptoms of the disease are present, and yet the patient has never been detected eating earth, and probably never has done so. On the other hand, from one or two cases that have come under my notice, I have no doubt that earthy substances may sometimes be taken into the stomach for a considerable length of time, and the health not be materially affected thereby, provided the habit be not carried to excess.

IV. *Treatment*.—Few cases of this disorder, if it has existed for any length of time, will admit of absolute cure. The prospect of meeting with success from medical treatment will depend, in a great measure, upon the nature of the causes from which the malady has sprung; but to attain this knowledge is by no means an easy task. Very little information can be obtained from the pa-

tient, the account he gives tending rather to mislead. His previous character and habits, and the history given by his friends, are in general the only means of ascertaining the truth, and coming to anything like a correct conclusion. It must at once be obvious that if the origin of the attack can be traced to moral causes, as to discontent, jealousy, or any other distressing mental affection, the administration of medicine can be of no avail, until this state of the mind be remedied, if, indeed, it be not beyond the reach of removal or alleviation.

The weakened and impaired state of the digestive organs, and relaxation of fibre throughout the system, clearly mark the disease as one of debility, and indicate the use of tonic medicines as the most appropriate mode of treatment. If the case should happen to be complicated with inflammatory symptoms, these, of course, are first to be subdued. A great variety of medicinal agents of a tonic nature, both vegetable and mineral, have been recommended, and amongst these the different preparations of iron have held the first place. Whatever tonic medicines are prescribed, it is usual to combine them with antacids to neutralize the acid and irritating fluid in the stomach and intestinal canal. The pain complained of, however, is not such as negroes describe when suffering from a common attack of indigestion with acidity, but a constant gnawing or craving, from which they are seldom altogether free. The carbonate and sulphate of iron and tincture of the muriate are the preparations of that metal usually selected. The following combination has been found useful :—*Carb. Ferri*, gr. iv.—vi., *Carb. Sodæ*, gr. vi.—x. *Sulph. Quinin.* gr. i. M. To be given in syrup or jelly two or three times a-day. The sulphate was usually exhibited in pills combined with extract of gentian, rhubarb powder, &c. ; but when there was much debility, a certain quantity was dissolved in a bottle of madeira, and a wine glassful, or smaller dose, given twice a-day, and often with very good effect. The iodide of iron was prescribed in a good many cases, and proved to be one of its best preparations, especially when there was a tendency to dropsy, or dropsical effusion already existed, the absorption of which it powerfully promoted. The dose was from one to three grains in pills, with a small proportion of opium. But while means are employed to strengthen and improve the digestion, the exhibition of gentle purgatives to carry off the morbid intestinal and biliary secretions are not to be neglected, such as mild doses of magnesia and rhubarb with ginger, the infusion of senna with carbonate and sulphate of magnesia, and addition of any aromatic tincture, castor oil, &c. When symptoms of disorder of the liver were present small doses of blue pill were given at intervals, combined with extract of gentian and rhubarb or ipecacuan powder, taking care to avoid the specific action of the mercury, which, by increasing the general debility, could only have been

productive of mischief. To promote the flow of the catamenia, emmenagogue medicines were sometimes administered, but it was generally found that, with the return of health and strength, the menstrual discharge reappeared, and the uterus became capable of performing all its functions. The regulation and quality of the diet is a point of material importance. Light and easily digested food should be given frequently, and in small quantities, rather than impede the digestive process by overloading the stomach. The appetite is often extremely capricious, and there are longings for certain articles of diet, generally some sort of salt provision, as beef, pork, &c. It is well that the patient should occasionally at least be indulged, provided the substances he desires are not decidedly pernicious, for if denied he may become sullen, intractable, and unwilling to submit to any kind of treatment. As soon as the digestive organs began to recover tone, more generous diet was ordered, and animal food, with wine, or other stimulants, allowed in moderation; indeed, when the debility was great, wine was given from the commencement. As any sudden change in the mode of living may give origin to the disease, so the effect of good diet, duly regulated, will sometimes produce a cure without much aid from medicine.

A negro woman, between 20 and 30 years of age, cook on an estate, was for some misconduct dismissed by the manager, and sent to labour in the field. In a short time she came to hospital with all the symptoms of *mal d'estomac*, which she attributed to obstruction of the menstrual discharge. Medical treatment did no good, till she was reinstated in her office as cook, when a change for the better was soon manifest; she went on rapidly improving, recovered her usual health, and afterwards bore a healthy child. The cause here was evidently the alteration of diet, and manner of living, and probably chagrin at losing her situation as cook. With but little assistance from medicine the disease was overcome, simply by the removal of the causes in which it originated.

Children were sometimes cured by merely placing them under the charge of the cook, or some other house servants, where they were at no loss for an abundance of wholesome food, and at the same time a strict watch was kept on them, in order effectually to put a stop to the habit of eating filth. Though with children this end might be accomplished without much difficulty, in adults the most constant vigilance, strict confinement, or even threats of punishment were insufficient to prevent them from indulging their morbid cravings. When under close confinement, ashes or filth, gathered from the floor, would be used, or if too weak to move from the bed, the lime on the wall or partition of the hospital, would be scraped off with the nails, and greedily devoured.

Cleanliness required particularly to be attended to; for the patients seldom think of using water for the purposes of ablution.

tion, unless compelled to do so. In the advanced stages a like indisposition was shown to take any kind of exercise. The method usually adopted was to make the patient walk about for a certain length of time daily, short of producing fatigue, under the surveillance of the sick nurse, or some other trustworthy person.

The earth-eater, where it is in his power, exerts a choice in the selection of the material he makes use of. The substance usually preferred is a soft clayey rock, found only in some parts of the island. It has a spotted marly appearance, and breaks down readily between the teeth, having a soft soapy taste. Another kind of clayey rock used is of a light gray colour, and crumbles into powder if exposed for some time to the rays of the sun. Many of the *mal d'estomac* negroes subjected the clay to the action of strong heat before eating it.

To illustrate the pathology of the disease, and to show the effects of medicinal agents in the treatment, a few *post mortem* examinations and cases are subjoined.

1. June 4th 1833.—Bacchus, cattle-herd, Geneva estate, long the subject of *mal d'estomac*, about 30 years of age, brought to hospital with symptoms of violent pneumonia, died the third day.

Autopsy.—Hepaticization of the lungs, with sanguineous and purulent infiltration; adhesions between the *pleura costalis* and *pleura pulmonalis*.

The auricles of the heart contained polypous-looking tumours of a greenish colour; the one in the left auricle was of considerable size; it had formed numerous attachments to the inner surface of the heart, and stretched down into the ventricle, sending prolongations into the large blood-vessels. The tumour in the right auricle adhered to the inner surface of the heart in the same manner as on the left side.

The coats of the stomach were thinner than natural; the mucous membrane very pale, could be easily scraped off with the back of the scalpel.

The tongue, inside of the mouth, and gums were white.

2. August 30th 1834.—Mercury, negro on the Emsal estate, died of *mal d'estomac* after being ill in hospital for several months.

Autopsy.—Slight dropsical effusion in the cellular membrane under the skin, over the greater part of the body. Not so much emaciation as usual.

Stomach pale and flabby, contained a considerable quantity of dark-coloured turbid fluid; mucous membrane softened; deep ulcerous excavation, the size nearly of half-a crown, at the pyloric orifice; the spleen was here firmly adherent to the stomach; on separating these adhesions the coats of the stomach were found completely destroyed by the ulceration, effusion into the peritoneal cavity being prevented by the attachments formed around the ul-

cerations, between the spleen and stomach. The intestines contained a large quantity of dark-coloured fluid. The mucous membrane, like that of the stomach, was pale and softened.

In the left auricle of the heart was a fibrinous tumour nearly the size of a hen's egg, which was connected to the lining membrane of the heart and *columnæ carneæ* by long lobes.

The lungs, liver, and other organs were healthy in structure.

3. February 18th 1837.—Mary Ann, middle-aged negress, for some years affected with *mal d'estomac*, died rather suddenly.

Not much emaciation; tympanitic distension of the abdomen.

Stomach.—Mucous membrane softened and easily separated from the muscular coat; very pale; not a blood-vessel to be seen; patch of discoloration near the pylorus. At the pyloric orifice were two deep ulcers, pale as the mucous membrane, the largest was about the size of sixpence; the base of these ulcers was hard and scirrhus when cut into, almost resembling cartilage; paleness and softening of the intestinal mucous coat. The liver was pale but healthy in structure.

Lungs.—Outer surface paler than natural; on making sections serous infiltration was found and appearances of increased action.

No disease of the heart was recognized.

4. 1835.—Charlotte, negro girl, under treatment for *mal d'estomac* for several months. Ascites supervened, and subsequently an acute attack of peritoneal inflammation, of which she died.

On opening the abdomen nearly a gallon of sero-purulent fluid escaped; the convolutions of the intestines were matted together and glued to the stomach, liver, and other organs in contact with them; the greater part of the peritoneal surface of the intestines was covered with purulent matter.

The mucous membrane of the stomach was very pale, but not softened; the coats were slightly thickened both at the pyloric and cardiac extremities; small pieces of ashes were found sticking in the mucous coat; the inner surface of the intestinal canal was of the same appearance as the stomach; in the jejunum and ileum were seen numerous small spots of a purple and black colour, the largest not above the size of a millet-seed. Thickening at the *caput cæcum*; the inner surface of this portion of the intestine was covered with minute spots as if a multitude of granulations were shooting from the mucous membrane.

Liver, except being paler than natural, healthy.

5. October 25th 1836.—Visited Rose, elderly negress, Emsal estate, and learned that she had a severe attack of bowel complaint some months ago; previous to that time she was apparently in good health, and performed the usual work of the estate. Since the above attack she has never enjoyed her accustomed health. She stated that, for several days past, she had purging with griping; she was weak and much emaciated; countenance

bloated, with the languid apathetic expression peculiar to the disease; mouth and tongue white, moist; points and patches of a purplish colour on the surface and edges of the tongue; skin rough, dry, and harsh to the feel, colour lighter than natural; pulse 120, weak; no menstrual discharge for two years.

One pill consisting of one grain of sulphate of quinine, one grain of ipecacuan, and half-a-grain of opium, was ordered to be given three times daily.

November 1st.—Purging is checked; she is feverish; skin warm; pulse feeble and quick; complains of beating at her heart and in the head; when the hand is placed over the region of the heart the impulse communicated is very strong; says the belly is much better; the only pain she has is in the breast.

R. Iodid. Ferri gr. ii. Opii gr. ss. night and morning.

3d.—Expression of countenance more animated; says she feels better; appetite improving; pulse slower, somewhat fuller but still feeble; palpitations abated; bowels regular. The pills were given three times daily.

January 3d 1837.—The patient continued to take the medicine regularly till within the last few days. She is much improved in appearance; says she feels much better; now doing a little work at her own request; tongue still white with spots of discoloration, but not in the same degree as formerly, nor is it so smooth as when she commenced taking the iodide of iron; pulse natural but rather weak; no palpitations; is stronger.

6. November 4th 1836.—Mary Ann, negro girl, aged about 25, attached to a coffee estate in the mountains, was sent from thence about eight or nine months ago to a sugar plantation in rather an unhealthy valley, where she says she fell ill and the menses became irregular. She was removed for some time to the coffee estate for change of air, but to the present time has continued ailing. The tongue, gums, and mucous membrane of the mouth were white; the tongue retained its roughness; countenance had an unhealthy look, of lighter tinge than natural; she complained of beating at the heart and inability to walk any distance or do any work, exertion causing debility of her limbs and increase of the palpitations. Menstrual discharge scanty, and when it does appear, which is at irregular intervals, she feels great lassitude and weakness of the lower extremities.

One pill, consisting of two grains of iodide of iron and half-a-grain of opium, was ordered to be given three times daily; and good nourishing diet was prescribed.

December 5th.—This patient is rather better, but she does not seem to have benefited much from the treatment, nor is it likely that any treatment will be of service, as she appears determined not to reside on the estate, and has no wish to get well.

7. November 3d.—Visited Felicité, negro girl, Shawford estate.

She has sunk down on the floor exhausted after walking from her house, about fifty yards distant; complains of great debility and beating at her heart; pulse weak and quick; skin warm; expression of countenance languid, of lighter hue than natural; tongue white over all its surface, with dark-coloured spots at the edges, retains its roughness at the centre; gums and lips whitish; is suckling a child eight months old; admits that she contracted the habit of eating earth during pregnancy.

A nurse to be found for the child.

R *Sulph. Quin.* gr. j.; *Pulv. Rhei*, ij.; *Carb. Sodæ*, gr. vj.
M. *Fiat pulvis, ter in die sumendus.*

9th. Patient has recovered strength, and looks better, though still weak; pulse excited; countenance more animated.

R *Iodid. Ferri*, gr. ij.; *Opii*, gr. ss. *Fiat pilula.* To be given three times a-day.

December 7th. Much improved; can now walk about without feeling fatigued; has gained in flesh; countenance has a better colour; pulse natural; tongue has recovered a little of its healthy redness, particularly at the centre. Continue the pills. This girl quite recovered from the disease.

8. January 11th 1837. Visited Etienne, Shawford estate, negro girl, aged about 20. Long affected with *mal d'estomac*; in the last month of pregnancy; great debility; has walked a short distance, and is quite exhausted; general œdema; lower extremities swelled to almost twice their natural size; countenance bloated and without animation; breathing oppressed; can hardly speak; pulse feeble and undulating, cannot be counted; tongue quite white; colour of skin altered; no perspiration.

The patient was put on nourishing diet, and a powder, consisting of ten grains of carbonate of soda, two of sulphate of quinine, and four of rhubarb, was given twice daily.

February 13th. Was delivered on the 17th January; child died shortly after; still in a state of great debility, and cannot leave her bed; dropsical effusion not diminished; pulse very quick and weak; countenance tumefied, with the same stupid expression.

Seven grains of iodide of iron and one grain of opium were made into four pills, of which she was ordered to take one three times daily.

18th. Appears a good deal better; countenance has a much more animated and natural expression, and not so much bloated; the effusion is still considerable, but has decreased much; she has recovered strength, and can walk a little distance; tongue looks better; pulse slower and stronger; is in better spirits; the medicine acts gently on the bowels. Continue.

March 7th. Much altered for the better; she is laughing and in excellent spirits; œdematous effusion almost gone; tongue con-

siderably improved in appearance ; not by any means so white as formerly ; can walk about without feeling fatigue. Continue medicine ; a dose of castor oil occasionally. This patient made a good recovery.

9. The following *post mortem* inspection is added, from the cachectic appearance of the body, connected with the presence of coagula in the heart. The man (a negro, aged about 25 or 30,) died very suddenly under circumstances that led to an inquest being held on the body.

Elephantiasis of the left leg extending above the calf ; ulceration on the posterior surface of the same extremity below the knee-joint.

Abdomen.—About two quarts of straw-coloured fluid in the peritoneal cavity. Liver enlarged, filling the right and left hypochondriac region, and diseased in structure ; harsh and gristly under the edge of the scalpel ; the surface of the divided parts has a mixed appearance, a dirty-whitish substance being deposited in streaks, lines, and spots throughout the structure of the organ ; gall-bladder filled with thin bile ; stomach contained a quantity of indigested food ; viscus sound in structure ; other abdominal organs healthy.

Chest.—The space left, on the sternum being removed, was entirely occupied by the heart and pericardium. On opening the pericardium, more than half-a-pint of straw-coloured fluid escaped. Heart much enlarged ; cavities gorged with blood ; right auricle contained an irregularly formed coagulum, nearly the size of a turkey's egg ; it adhered firmly to the inner surface of the heart by lobes stretching from the mass, a good part of which descended into the ventricle. The tumour was soft, of a light leaden colour, with smooth surface. In one part it was tinged the colour of the blood. Several loose coagula ; some of these lightish-coloured ; left compartments distended with fluid blood and coagula ; in the ventricle there was a tumour flattened in form, surface smooth, and light-coloured, without any tinge of blood ; it adhered by one side to the lining membrane of the heart, and required some force to be used for its separation ; dilatation of all the cavities of the heart ; right and left ventricles hypertrophied. After extracting the coagula, the organ weighed $17\frac{1}{2}$ ounces avoirdupois ; lungs healthy.

The head was not examined.

Before concluding this paper, it may not be considered uninteresting to make mention of rather a singular mode of using tobacco (in the form of snuff) in this island, and, I believe, in other West India colonies, as the habit gives rise to symptoms analogous to those of *mal d'estomac*. On a stranger's arrival in the island, his attention may be attracted by many of the negro and coloured women having a small piece of wood, generally a slip of

bamboo, protruding from the mouth. On inquiry, he is told that it is used for cleaning the teeth in the following way. The twig, or slip of bamboo is rubbed at one end, till the fibres form a sort of brush; this is dipped in snuff, with which the teeth are cleansed. Probably but a small quantity may be used at first, but, after a time, the piece of wood is allowed to remain in the mouth, and the snuff swallowed with the saliva. Snuff, wrapped in a leaf, is carried about the person, usually stuck in the waistband, and in this the wooden brush is dipped from time to time, and replaced in the mouth, the powder gradually finding its way into the stomach. The quantity of snuff consumed in this way is astonishing, but many indulge the habit secretly, who are ashamed to betray openly their devotion to this filthy custom, which appears to be altogether confined to women. For some time, while the quantity taken into the stomach is but small, the effect upon the health can scarcely be marked, but, as the habit becomes more and more confirmed, its pernicious consequences are soon visible. The appetite is destroyed; the snuff-eater will remain for a whole day without nourishment, or having any desire for food. The pale lips, emaciated cheek, and sunken eye, bespeak the inroads the poison has already made on the system. This vile habit seems to have all the fascination of opium-eating. To be deprived of the accustomed stimulus is misery, and, like opium, the quantity must be almost daily increased, till at length the slip of wood is dispensed with, and the snuff is thrown into the mouth with the fingers, at short intervals of time. When the habit is not indulged in to excess, the system will sometimes resist the influence of the poison for years; but if persisted in, its deleterious and fatal effects are shown by the general emaciation and loss of strength that ensues. The functions of digestion are totally deranged; the stomach is irritable, and rejects food when taken, and not unfrequently rum or some other spirit is resorted to, to appease the craving and uneasy feeling in the epigastric region. The functions of the uterus are also suspended. While the system is in this state, if the snuff-eater be attacked with fever, dysentery, or any acute disease, the chance of recovery is but small. Should the unhappy votary not be carried off by an acute attack of disease, but by the slow operation of the poison, in the last stage there is great debility; the countenance becomes bloated; the feet swell, and a general dropsy takes place, soon ending fatally. There is a close resemblance to *mal d'estomac* in the last stage and the termination.

10. The only opportunity I have had of making an inspection after death from habitual ingestion of tobacco-snuff into the stomach is the following.

January 25th 1841. Visited Angelique Taylor, young negro woman. General dropsical effusion; abdomen enlarged from the

presence of fluid ; lower extremities much swelled ; breathing embarrassed ; feels sometimes as if she would suffocate ; countenance bloated ; skin lighter than natural, dry, and warm ; tongue moist, white, as well as the mucous membrane of the mouth ; pulse 120, weak ; bowels irregular, catamenia absent for many months ; strength greatly reduced, can scarcely leave her bed. Has been eating snuff for years, and only desisted from the habit lately, as she was told it was the cause of her sickness. Says she cannot now refrain from eating starch, arrow-root dry, &c. She was treated with iodide of iron, &c. but the details of the case need not be entered into. She was attacked with erysipelas of the left lower extremity, and died.

Post mortem examination five hours after death.—Not much œdema of the upper extremities or thorax. On making the usual incisions, a thin bloody serum oozed from the cellular substance.

Abdomen.—About four quarts of clear straw-coloured fluid collected from the abdomen ; peritoneum free from any appearance of vascularity. The liver larger than usual, and projects into the thoracic cavity ; colour much darker than natural ; gall-bladder contains a considerable quantity of thin light-coloured bile. The external and internal surfaces of the stomach pale ; no blood-vessel to be seen ; contains some viscid yellow bilious matter. The mucous membrane is thickened and thrown into numerous large folds. The muscular coat is also thickened, and when cut, the opposite surfaces are quite white. The intestinal canal has the same appearance as the mucous coat of the stomach, particularly the duodenum, which is thickened.

Thorax.—Pericardium distended with half-a-pint of fluid, the same as that contained in the abdomen ; left side of the heart and large vessels filled with thin fluid blood of a light chocolate colour ; left ventricle hypertrophied, and contains a small dark-coloured loose coagulum ; lungs healthy.

The head was not examined.

The fluid collected from the abdomen and pericardium in a few minutes coagulated into a clear gelatinous-looking mass. This is frequently the case with the serous fluid effused in *mal d'estomac*, which will sometimes coagulate when running along the table.

ART. VII.—*Pathological and Histological Researches on Inflammation of the Nervous Centres.* By JOHN HUGHES BENNETT, M.D. Fellow of the Royal College of Physicians, Lecturer on the Practice of Physic, Physician to the Royal Dispensary, Edinburgh, &c. &c. (Continued from Vol. lviii. p. 396.)

Obs. XVII.—*Hemiplegia on the left side of long standing ; great dyspnœa ; cardiac disease ; circumscribed softening in the*

right cerebral hemisphere, like chalky milk, wholly composed of exudation corpuscles and granules ; small circumscribed cheesy softening on the right lobe of the cerebellum containing exudation corpuscles ; heart hypertrophied ; mitral disease ; aneurism of the left auricle.

Archibald Robertson, aged 36, shoemaker, admitted into the Royal Infirmary under Dr Paterson, August 5th 1842. This man was in the house May, 1841, labouring under hemiplegia of the left side, at that time recent. For sixteen months, he has been affected with cough and dyspnœa, especially on ascending a height, and has sometimes had hæmoptysis. On one occasion, he spit up fully two pints of blood. On the 7th of August 1842, it is reported that the heart's impulse was strong, and that a murmur accompanied the first sound, which was loudest on the left side of the sternum. He could walk, but the power of motion in the left arm was much diminished. He left the house on the 23d of September, but returned on the 29th. He now laboured under great dyspnœa, accompanied at intervals with lancinating pain in the region of the heart. The lower extremities were slightly œdematous. The abdomen distended with fluid ; urine scanty and highly-coloured ; bowels confined ; pulse 112, small and thready. October 5th. Increased dulness over the region of the heart on percussion, extending three inches below the nipple. The impulse corresponds to the pulse at the wrist. A loud murmur, almost rasping, heard three inches below the left nipple, but distinguishable over a larger space than usual. Distinct murmur and sonorous rales were heard under both clavicles. The symptoms gradually increased in severity. The dyspnœa became more intense, attended with a sense of constriction in the upper part of the chest and throat. The anasarca and ascites increased, and amount of urine diminished. Died October 19th.

Sectio, October 20th.—On removing the scull-cap, subarachnoid effusion was observed, elevating the membrane to a level with the convolutions. On the right side, under the arachnoid, there was a considerable layer of effused lymph, in which the branches of the Sylvian artery were imbedded. The coats of the main artery were also thickened and opaque. The cerebral substance on section was of unusual firmness. In the right cerebral hemisphere, external to the ventricle, there was a softened portion, about the size of a hazelnut, apparently composed of minute white granules, swimming in a thick fluid (*lait de chaux* of the French). The ventricles contained an ounce of fluid collected by the pipette, and some also escaped. There was also slight effusion at the base. On the surface of the right lobe of the cerebellum was a circumscribed cheesy softening, the size of a large pea, and of a fawn colour.

The lungs were œdematous, and the bronchi full of mucous fluid. The right lung was adherent to the ribs, and on the left there was considerable effusion of yellow-coloured serum in the pleural cavity.

The pericardium contained a considerable amount of dark-coloured fluid. The heart was large, weighing 1 lb. 1½ ounce. The auriculo-ventricular opening on the left side was reduced to a slit, which

would only admit the handle of a dissecting scalpel, caused by expansion and protrusion of the folds of the mitral valve. The left auricular appendix was of large size, and distended with a firm coagulum. This dilatation of the part communicated with the general cavity of the auricle by means of an opening as large as a shilling.

Microscopic Examination.—The softening in the cerebellum contained numerous exudation corpuscles and granules, both loose, and coating the vessels. The white softening in the right hemisphere, however, was somewhat peculiar in character. On pressing a small portion of it between slips of glass, it presented numerous exudation corpuscles, perfectly round, generally about $\frac{1}{30}$ th of a millimetre in diameter, filled with granules, about $\frac{1}{40}$ th of a millimetre in diameter. Similar granules existed loose in large quantities between these corpuscles. There were no traces whatever of nervous structure, and the regular medium size of the exudation corpuscles and granules formed a strong contrast to the variations existing in this respect, as observed in other cases. See Plate I., Fig. 1.

Remarks.—The nervous symptoms in this case were apparently confined to hemiplegia of the left side, which, it is stated, was recent in May 1841, and which, consequently, at the time of his death in October 1842, must have been between eighteen and nineteen months standing. The mode of its appearance is not alluded to. On examination, two softenings were discovered,—one on the surface of the cerebellum, the other in the substance of the right hemisphere. The latter was apparently recent, and, together with the arachnitis and effusion of lymph, seemed to have produced no symptoms, or, as is more probable, such only as were masked by the more urgent functional disturbance occasioned by the cardiac lesion. The long standing hemiplegia was evidently dependent on the softening found in the right hemisphere, a little external to the ventricle. This presented that peculiar character denominated milk of chalk, (*lait de chaux* by the French), a term sufficiently descriptive of its appearance. I have frequently had an opportunity of seeing this form of cerebral softening at the Salpêtrière Hospital in Paris, where it is not uncommon. This, however, is the only instance which I have seen of it in Edinburgh, and I consequently examined it microscopically with great care. The description previously given will show that it differed considerably in its histological characters from any of the forms of softening I have described.

Obs. XVIII.—*Phthisis; sudden loss of consciousness, and paralysis of the right side; gradual recovery; fourteen days subsequently, a second attack, and paralysis of the left side; death three days after; softening of both corpora striata, most extensive on the left side; numerous exudation corpuscles in the left corpus striatum; vessels in the right corpus striatum coated with exudation granules and a few corpuscles.*

Ann Cameron, aged 39, admitted June 20, 1842, under Dr Paterson, labouring under all the symptoms of *phthisis pulmonalis* in its second stage. This disease continued to make progress, when, on the morning of October the 25th, on getting out of bed, she was suddenly seized with loss of speech and insensibility. Two hours after intelligence returned, but she continued speechless. There was complete paralysis of the right arm, but she could slightly move the right leg, and the sensibility, though impaired, was not absent. The mouth, on her attempting to speak, was drawn to the left side, and the tongue, when protruded, was turned to the right. She seemed to be suffering from cephalalgia, Pulse was 105, rather small, and the breathing slightly stertorous. The pupils were not affected, bowels open. October 26th, She can articulate a few words, and has recovered considerable command over the leg. She can also move the arm slightly. November 1st, The intellect and the power of speech are fully restored. She can also freely move the right arm and leg, and now only experiences in them slight weakness. The cough is very troublesome, and she expectorates about three ounces of muco-purulent fluid daily. The appetite is good, but she is rapidly wasting. No pain in the head or chest. Respiration easy. On the night of the 9th of November she experienced an attack similar to the one which occurred on the 25th of October. The breathing was stertorous, and 25 in the minute. The pulse 112, small and weak, and the power of speech and the intelligence were arrested. The left side was affected with paralysis, whilst the right continued as before. Two hours after the attack consciousness slightly returned, but coma gradually supervened, and continued till her death, which took place on the 12th.

Sectio, November 14th.—Considerable effusion in the subarachnoid cellular tissue, elevating the membrane to a level with the convolutions. On slicing the brain a larger number of red dots than usual were observed. The left *corpus striatum* was softened throughout, of a dirty-yellow colour, and its centre was so diffuent, that on making a section, a cavity the size of a hazel-nut was left in its interior. From this centre the softening became less and less, till it terminated in healthy structure. The upper surface of the right *corpus striatum* was also softened and slightly pultaceous. The ventricles contained very little serum, not more than a teaspoonful, and their walls, as well as the other portions of the brain, were healthy.

There was great emaciation of the body. Both lungs were studded with tubercles in different stages of development. Heart small; mitral valve somewhat hard and thick in its folds. The liver was very large and somewhat fatty, weighing 4 lbs. 15 oz. Tubercular deposits existed in the solitary and aggregate glands in the lower part of the ileum; kidneys slightly granular.

Microscopic Examination.—The *corpus striatum* of the left side consisted of broken down cerebral substance, with multitudes of exudation corpuscles. The right *corpus striatum* contained few exudation corpuscles, but its vessels were coated with granules to a considerable extent.

Remarks.—The principal features in this case were two distinct attacks at an interval of fourteen days, the first causing paralysis of the right side, and the second that of the left. On examination, both *corpora striata* were found softened, the left, however, much more so than the right. It was also determined that whilst in the left *corpus striatum*, which was first affected, numerous exudation corpuscles and granules existed, in the right one, the former were few, and the latter principally coated the vessels. Here, then, the number of the corpuscles, and the isolated character of the granules are seen to bear direct reference to the duration and amount of the softening.

No notice is taken of the existence of contraction or rigidity of the extremities in this case.

OBS. XIX.—*Pulmonary tubercle ; hemicrania ; gastric fever ; delirium ; death on the 16th day of the fever ; effusion into the ventricles ; central white softening of the cerebral substance ; absence of exudation corpuscles or granules.*

“MY DEAR SIR,—I beg to send you an abstract of the case which you told me you wished to make use of in your researches on inflammation, and which it will give me pleasure to learn may prove serviceable to you.

“A young lady of 17, of delicate frame, of irritable temperament, and recently exposed to causes of much mental disturbance, was attacked during last summer with suspicious chest symptoms, on account of which Dr Davidson and I were consulted about the middle of October last. We were so strongly inclined to the opinion that condensation had taken place in the upper part of the right lung, as to advise her removal to a warmer climate. Two days before her intended departure, she was seized with severe vomiting of all ingesta, some general fever, and urgent hemicranic headach, which had long been a frequent visitor. The vomiting was relieved by hydrocyanic acid. For ten days she continued to labour under frequency of the pulse, foulness of the tongue with elongated papillæ, tendency to sickness and occasional vomiting, sometimes slight tenderness in the epigastrium, complete loss of appetite, disturbed sleep, and irregular attacks of chilliness and heat. She was considered by Dr Davidson and myself to suffer from gastric fever. About the close of that period, the headach being unusually severe, though still hemicranic, and information being communicated that, two months before we were consulted, she had been stunned for a minute or two by a fall from horseback, we thought it right to keep in view during the treatment the possibility of some idiopathic affection of the head being the source of her illness. The case, however, continued in the main to advance like one of severe gastric fever. On the night of the twelfth day there was mild delirium but no other change ; on the night of the thirteenth rather more delirium. On the forenoon of the fifteenth day, the pulse, which previously ranged from 110 to 120, had risen to 132 ; but

she felt more comfortable, and the tongue was apparently improving. During the night which followed, the delirium was greater than it had ever been, and her friends could not get a correct answer from her. Towards morning she became quiet, and was supposed to have fallen asleep, but about half-past seven she suddenly turned on her right side, gave one or two groans, and expired. There was never any contraction of the arms or any trace of paralysis.

" Sectio, 30 hours after death.—The upper lobe of both lungs was studded with minute tubercles. The *dura mater* was vascular; the arachnoid over the whole brain, even in front, minutely reticulated with red vessels. The convolutions on both upper external regions flattened and dry; the lateral ventricles distended with nearly two ounces of clear serosity, the septum lacerated, the parietes every where softened, but to no great extent, and without any change of colour. There was no lymph anywhere. The *medulla oblongata* and the spaces between it and the cerebellum were covered with a greenish yellow gelatinous exudation.—Yours, very truly,
To Dr Bennett. R. CHRISTISON."

Microscopic Examination.—I examined a portion of the softened cerebral substance which was removed by Dr Peacock, who conducted the examination. No exudation corpuscles or granules could anywhere be detected. The tubes were readily separated from each other but not broken down.

Remarks.—This case is one of by no means unfrequent occurrence in practice. There is fever, delirium supervenes, death takes place, and on examination effusion of fluid is found in the ventricles, with more or less central softening of the brain. Under such circumstances, the practitioner conceives the lesion to have been inflammatory, and reproaches himself with not having been more active in combating the cerebral symptoms. It is for this reason I have been particular in giving the case in Dr Christison's own words, because it must be evident from the details entered into by a practitioner so eminent, that some such ideas must have occurred to him. Now, it may be asked, is the softening in these cases truly inflammatory, or is it merely a *post mortem* phenomenon? To determine this question it will be necessary to study the minute structure of the softening, and the accompanying symptoms of other cases in which the lesion was undoubtedly inflammatory. In every instance where inflammation was unequivocal, exudation corpuscles or granules were detected. These were entirely absent in the present case. In the first ten observations recorded, inflammatory softening of the cerebral substance existed. A reference to these will show, that in every instance there was either loss of consciousness succeeded by dulness of the intellect, convulsions, contractions, or paralysis. Obs. X. presented a similar lesion to the eye, but exudation corpuscles were found in the softened portions, and there were tetanic spasms and profound co-

ma. The patient, however, was only ten months old, and symptoms differ so much in infants and adults, that we can scarcely draw a correct analogy between them. Obs. XV. most resembles the present case. A girl, aged 18; considerable central softening existed, containing no exudation corpuscles, but combined with capillary apoplexy. Here there was loss of consciousness and convulsions. In the case under review there were no convulsions, contractions, or paralysis; no sudden loss of consciousness or dullness of intellect. None of the symptoms, in short, which we have seen to accompany central inflammation of the brain. The leading head symptoms were hemicrania and delirium. Hemicrania has never been observed to be connected with cerebral softening. Delirium, when it occurs, is accidental, and dependent, as we shall afterwards see, upon changes occurring, not in the central but in the *peripheral* portions of the brain. There can be little doubt, therefore, whatever may be nature of the softening in this case, a point I shall more fully discuss hereafter, that it does not depend upon inflammation of the nervous tissue.

Obs. XX.—*Impaired intelligence; loss of speech; disorganization of the left eyeball; convulsions; coma; death in five weeks after receipt of the injury; abscesses and softening in the left anterior and middle lobes of the cerebrum, the latter containing numerous exudation corpuscles; extensive central softening of the brain and right hemisphere, with absence of exudation corpuscles.*

Alexander Blaker, aged 14, admitted into the Royal Infirmary, October 3d 1842, under Dr Paterson. Three weeks before admission he complained of pain in the head, which, from that time, underwent a gradual increase. A week subsequently, the left eye became actively inflamed. It was stated that he had received a blow over the eyes with the stroke of a whip, which was afterwards found to be incorrect.

On admission his intelligence was greatly impaired, and the eye was inflamed. Whilst in the Infirmary, no report was taken of his case, but the following seem to be the principal symptoms which were observed. During the whole time he was incapable of speaking, but made inarticulate sounds and signs, to indicate his want of food or drink; at the same time he passed his evacuations in bed. He could, however, rise and walk as far as the fire, when he was observed to turn towards the left side. There was no paralysis of the arms; the eye became completely disorganized; the cornea sloughed, and a large portion of the iris protruded through the aperture. The vision of the other eye seemed also to be imperfect. Two days before death, he had a severe rigor while sitting by the fire, followed by vomiting. The next day it was stated that he had been seized with a convulsive fit. After this he became comatose, and died on the 15th.

Section, October 17th.—On elevating the vault of the cranium, the

dura mater appeared healthy, except at the left side, corresponding to the squamous portion of the temporal bone. Here, for a space about the size of half-a-crown, it was rough from irregular deposits of lymph. On dividing the *dura mater* at this point, a large quantity of very thick greenish-coloured purulent matter escaped, half-an-ounce being collected, and at least double that amount being lost. The subarachnoid cellular tissue, covering the cerebral lobes superiorly, were deeply injected. The convolutions were greatly flattened, and the sulci almost obliterated.

On slicing the left hemisphere, a chain of abscesses, from the size of a shilling to that of half-a-crown, communicating with each other, was found in the external portion of the left anterior and middle cerebral lobes. These were full of a greenish purulent matter, and extended to the base of the cranium. The cerebral matter surrounding the purulent collection was softened, of a somewhat cheesy consistence, and slight yellowish tinge. The fornix, *septum lucidum*, and white matter surrounding the ventricles, especially the medullary matter on the right side, were of pultaceous consistence, of a clear white, and would not bear the slightest handling. Both lateral ventricles were considerably dilated and distended with serum of a milky appearance, which escaped on making the section.

On removing the brain, a portion of the temporal bone and greater wing of the sphenoid bone were found carious.

Microscopic Examination.—The purulent matter contained in the abscesses was of normal character. The softened cerebral substance surrounding the purulent collection, which was of a cheesy consistence, contained numerous exudation corpuscles. Large exudation masses also coated the vessels, and filled up the spaces between them. The softened cerebral substance surrounding the ventricles, the fornix, *septum lucidum*, and medullary portion of the right hemisphere contained no exudation corpuscles or granules. The cylindrical and varicose tubes, however, were readily separated from each other, but not broken down, and the varicosities on some of the latter were unusually large.* In many places some of these terminated in a large oval *cul de sac*, bounded by double lines, which were continuous with those forming the boundaries of the nervous tube. These *cul de sacs*, with the exception of the narrow neck which united them to the tube, were in every respect similar to the round and oval corpuscles so frequently observed floating loose.—See Plate I. Fig. 3.

Remarks.—In this case there was disease of the osseous structure at the base of the cranium. Abscesses had formed in the substance of the left cerebral lobe, a morbid condition which rarely results independent of lesion in the bones. The softened brain surrounding these contained numerous exudation corpuscles. Now it is remarkable, that in the same brain extensive softening in the

* Dr Peacock, Prosecutor to the Royal Infirmary, was present at the microscopic examination of this brain, and confirmed the results.

neighbourhood of the ventricles existed, in which none of these bodies were found. It should also be observed, that the fluid was of a milky aspect, an appearance which has hitherto been considered as indicative of inflammation. The body was examined fifty hours after death. The symptoms observed were evidently referable to the inflammatory action going on in the left hemisphere; the formation of abscesses and pressure upon or destruction of the nerves leading to the orbit. No decided paralysis was remarked, inasmuch as he could walk to and sit by the fire. His arms also were unaffected, and although he could not speak, he made movements to express his wants. The intelligence, however, is stated to have been impaired. In connection with these facts it should be remarked, that the abscesses and softening surrounding these were situated in the external portion of the left anterior and middle lobes. How different are the symptoms when the central organs are inflamed! It may be asked, did his bending towards the left side on walking indicate weakness on the right side of the body?

Obs. XXI.—Concussion of the brain from a fall; death seven days after the receipt of the injury; softening of both anterior lobes of the cerebrum, and right lobe of the cerebellum to a limited extent, with extravasation of blood; exudation corpuscles and granules in the softened portions; nervous tubes in the diseased part of the cerebellum much broken up, presenting a peculiar appearance.

Elizabeth Robertson, aged 22, admitted August 31st 1842, under Dr Duncan. This woman was brought to the house by the police, who stated that she had fallen down a stair backwards, when in a state of intoxication. On admission she was insensible, but appeared aware when an attempt was made to rouse her. The pulse was about 80, of good strength and regular; breathing laboured and stertorous; pupils rather contracted; temperature of the extremities natural. On examination a tumour was found on the left of the occipital protuberance; pretty copious bleeding took place from the right ear. In about five hours after admission sensibility returned. The pupils were rather dilated, but the breathing was still laboured and stertorous. Pulse increased in frequency and full. (V. s. ad ξ xxv.) September 1st, Headach; pulse 85, of good strength. (ξ viii. of blood taken from the temporal artery.) September 2d, Headach not being relieved, arteriotomy was again had recourse to. September 4th, Headach, *tinnitus aurium*, intolerance of light; pulse firm and slow. (18 leeches to the head.) September 5th, Stertorous breathing; restlessness and profound coma; pupils dilated and insensible; pulse 65, firm. V. S. ad ξ xvi. Pulse rose and became fuller with the bleeding. Blister to the head. September 6th, Coma continues; had slight return of consciousness this morning; respiration laborious and hurried; pulse quick; some inversion of the left eye. Died at 12 P. M.

Sectio, September 8th.—Extravasation of blood beneath the pericranium. On removing the *dura mater*, the arachnoid was found elevated in various places by a greenish solid exudation, which coated the *pia mater*, and followed its reflexions, even so far as the *plexus choroides* of the ventricles. The veins of the hemispheres were turgid with blood, and slight extravasation existed in various places. On the anterior surface of both anterior lobes a portion of the cerebral substance was softened. The diseased parts looked as if the textures had been lacerated or broken up, and infiltrated with blood. This last was in several places of a dark-purple colour, and resembled the lees of port wine. The softened portions were each about the size of half-a crown. A similar softening existed on the inferior surface of the left lobe of the cerebellum. The *dura mater* in the right fossa of the cerebellum was lacerated about one and a-half inches in length. The posterior wall of the lateral sinus was also divided where it lay on the fossa beneath the petrous portion of the temporal bone. There was an extensive fracture at the base of the cranium, traversing the petrous portion of the temporal bone. The *membrana tympani* was lacerated, thus affording a ready exit for the blood by the external ear. Blood was also extravasated into the cancellar texture of the bone, and over the right side of the base of the cranium between the *dura mater* and bone. The other organs were healthy.

Microscopic Examination.—The softened portions of the anterior lobes contained numerous exudation corpuscles, many of them nucleated. The nervous tubes were also considerably broken up. Those in the softened portion of the cerebellum resembled numerous round hollow corpuscles of various sizes, bounded by distinct double lines. See Plate I. Fig. 2. In some places these might be seen continuous with a varicose tube, as in Obs. XX. In the gray substance of the convolutions, which were covered with lymph, the terminal loops of the capillary vessels were coated with exudation granules.

Remarks.—In this case the usual symptoms of concussion of the brain were present. Consciousness returned after the shock of the injury had passed; coma succeeded, which terminated in death. Independent of considerable extravasation of blood, the cerebral substance was soft, broken up and lacerated in three places. Blood was infiltrated into the nervous texture, and numerous exudation corpuscles and granules existed in the softened portions. The nervous tubes were so broken up, as to present the appearance of distinct corpuscles. In these cases it would appear that the varicose tubes undergo a change; that the swellings upon them become larger, at the expense of the tubular portions, and that, when ruptured across, their extremities have the property of reuniting, so as to form independent round or oval corpuscles, which are hollow and highly elastic.

The existence of contraction or paralysis is not noticed in this case, and we should observe that the central portions of the brain were healthy, and that the lesions were confined to the periphery of the organ.

Obs. XXII.—*Hemiplegia of the left side, with contraction of the left arm ; rigidity of the muscles of the neck ; hemiplegia of the right side ; dulness of intellect ; resolution of the left extremity ; death ten days after the attack ; supposed softening of the right corpus striatum ; softening in the centre of the Pons Varolii, containing numerous exudation corpuscles and granules.*

Andrew Thomson, aged 25, by trade a butcher, of somewhat intemperate habits, admitted November 15, 1842, under Dr Paterson. He has enjoyed good health, with the exception of occasional dizziness of head, and bleeding from the nose, until eight days before admission, at which period, when following his occupation, he was seized with loss of power over the left side, but without any affection of the intellect. He was able to speak, and complained of giddiness and noise in the head. The side was destitute of sensibility, and his mouth was drawn to the left. He was bled, and took purgative medicines, but without relief, and the symptoms continued until the morning of his admission, when he lost the power of speech, and the right side became completely powerless.

On admission, he was able to move the right arm slightly, and made the attempt when desired to do so. The left arm was flexed upon the chest, and rigid, so as only to be extended by the exertion of force. The legs were completely paralyzed and relaxed. The mouth was firmly closed, and the head drawn backwards from tonic spasms of the muscles. All the paralyzed parts were devoid of sensibility. The urine and feces passed involuntarily. The pupils were somewhat dilated, and sparingly sensible to light. The intellectual powers seemed slightly, if at all impaired. The breathing was quick, laboured and stertorous, and the pulse 108. (Twenty leeches to the temples ; blisters to the head ; two drops of croton oil to be placed upon the tongue.) November 16th, No improvement, notwithstanding the powerful operation of the remedies ordered. Is less intelligent than before, and has less command over the right arm. The resolution of the inferior extremities, contraction of the left arm, and muscular rigidity of the mouth and neck continue. Pulse 120, more full. The face is flushed, and the breathing is more hurried and stertorous. Nov. 17, The intellect more obtuse. The left arm is no longer rigid, but completely resolved. The mouth admits of being partially opened. The neck continues rigid. In the evening became comatose. V. s. ad $\frac{3}{4}$ xv. Died at half-past five on the morning of the 18th.

Section, November 19th.—The arachnoid was elevated by an opaline gelatinous exudation, found in the subarachnoid cellular tissue. Posteriorly this membrane was elevated above the level of the convolutions. It was also studded with small opaque white spots, apparently from the deposit of lymph on its attached surface. The large veins on

the surface of the hemispheres were turgid with blood. On section the cerebral substance appeared unusually vascular. Three drachms of clear serum were found in the ventricles, and a small undetermined quantity existed in the base. The right *corpus striatum* was also softened, probably the result of mechanical injury. The *Pons Varolii*, near its centre, was found softened, to about the size of a hazel-nut. The lesion was more on the right than the left of the mesial line, and the texture of the part was not pultaceous, or altered in colour. *Medulla oblongata* normal.

Microscopic Examination.—The softened *corpus striatum* contained no exudation corpuscles. They were abundant, however, in the softened portion of the *Pons Varolii*, and more so on the right than the left side of the mesial line.

Remarks.—This is an exceedingly valuable and well-marked case, and illustrates the necessity of employing the microscope in our *post mortem* examinations. All the symptoms of acute softening were present, paralysis of the left side, including rigidity and contraction of the left arm, dulness of intellect, and tonic spasms of the muscles of the mouth and neck. The right side was also affected, but in a slighter degree. As the case excited considerable interest, great care was taken in examining the brain. When the lateral ventricles were opened, it became a question whether the right *corpus striatum* was softened. Several persons applied their fingers, and endeavoured to ascertain the point. As the manual examination proceeded the normal consistence of the part diminished, until at length it presented all the appearance of pultaceous softening. In this state it was shown to Dr Paterson, who naturally enough considered it to be the result of disease. I differed from him in opinion, first, because I had carefully observed the gradual increase of the softening in the manner alluded to; and secondly, because disease of the *corpus striatum* could not have explained the well-marked symptoms which existed on both sides of the body. When the *Pons Varolii* was bisected, Dr Peacock, who conducted the examination, conceived it to be softened; others who examined it could observe no difference in the texture; its colour and consistence were unchanged. Reasoning from the symptoms, the lesion was very likely to exist. But how, it was argued, could a judgment be formed? We ought to reason from facts not from theories. Here, then, was an evident lesion of the *corpus striatum*, which explained nothing, and a problematical lesion of the *Pons Varolii*, which, however, did it exist, would satisfactorily account for the symptoms. In this state of uncertainty the microscope was sent for, and it was demonstrated, and made evident to Drs Paterson, Peacock, and all the students present, that the *corpus striatum* contained no exudation corpuscles, whilst in the *Pons Varolii* they were very abundant.

I have endeavoured to describe exactly what took place on this occasion, from which it must be evident that, had not the microscope been appealed to, the right *corpus striatum* would have been pronounced softened, whilst the real lesion in the *Pons Varolii* might have escaped observation. Under such circumstances, this case would have added another to the inexplicable observations with which the records of nervous diseases abound. By means of the microscope, however, it was established satisfactorily that nothing morbid existed in the *corpus striatum*, and that it was most probably the result of mechanical lesion. On the other hand, it was demonstrated that the central portion of the *Pons Varolii* contained the same bodies which we have so frequently seen connected with inflammation in other cases. It was also shown that these were more numerous on the right than on the left of the mesial line, thus not only explaining the general symptoms of the case, but pointing out why the paralysis and contraction were better marked on the left side of the body.

Obs. XXIII.—*Apoplexy ; hemiplegia of the right side ; death in eight days ; extensive hemorrhage into the left cerebral hemisphere ; absence of exudation granules or corpuscles.*

Walter T.—* aged 75, enjoying good health, with the exception of occasional headache, was sitting down to supper on the evening of November 12th 1842, when he suddenly put his hand to his head, saying that he could not see, and that he thought he was dying. He gradually sunk into complete coma ; the respiration was stertorous ; complete resolution of the right side ; pupils contracted. Latterly there was no command over the sphincters ; there was never any rigidity or contraction of the extremities. Death took place on the 20th inst.

Sectio, November 22d.—There was a very large coagulum in the left cerebral hemisphere, filling up the ventricle, encroaching considerably on the right side. The cerebral substance surrounding it was broken up, pultaceous, and of a rusty-brown colour. Between six and seven ounces of blood must have been extravasated.

Microscopic Examination.—The softened cerebral substance contained fragments of tubes, blood globules, and coagulated masses of blood in large quantities, but no exudation granules or corpuscles could be discovered.

Remarks.—This case is interesting from its similarity to Obs. XI. in which nearly the same symptoms occurred, death took place at nearly the same time after the attack, and in both a large coagulum existed ; yet in the one the softened substance surrounding the clot contained evidences of inflammation, whereas in the other none of these could be found.

* Dr Ransford kindly invited me to be present at the *post mortem* examination of this case, which occurred in his private practice.

OBS. XXIV.—*Apoplexy; hemiplegia of the right side; partial recovery; sudden return of attack, with rigidity and contraction of right leg; death one month after the apoplectic attack; clot of blood in the left hemisphere, with softening; numerous exudation corpuscles; masses and granules in the softened portion.*

William Clarke, aged 41, admitted into the Royal Infirmary, under Dr Paterson, January 27, 1843, by trade a blacksmith, of intemperate habits, was seized on the 3d with apoplexy, followed by paralysis of the right side of the body. The attack had been preceded by cephalalgia. On admission there was hemiplegia of the right side. The mouth was drawn to the left side, and the tongue to the right. The articulation was indistinct. After bleeding, cupping, and purging, he recovered the use of his limbs so far as to feed himself, and even to walk. He had, however, occasional twitchings of the right side of the face. In this state he continued until January 30th, when he was suddenly seized with loss of consciousness, and tonic spasms of the right side of the body. (Venesection, and blisters to the head.) January 31st, To-day complete resolution of the right arm, but rigidity, and contraction of the right thigh, which was permanently flexed on the abdomen. Consciousness has returned, and he complains much on any attempt to straighten the rigid limbs. In the evening became comatose; pupils much contracted. February 1st, Rigidity has disappeared; lies in a comatose state. In this condition he continued. The teeth and lips became covered with sordes, and he died at 10 A. M., February 3d.

Section, February 4th.—On elevating the skull-cap considerable subarachnoid effusion was discovered, which posteriorly elevated the membrane above the level of the convolutions. On the left side, about the middle of the superior hemisphere, there existed a slight depression, on making a section through which a clot was found in the cerebral substance above the lateral ventricle. The clot was about the size of a pigeon's egg. It was firmly coagulated, of a brownish colour, and surrounded by a quantity of thin brown fluid. The cerebral substance in its neighbourhood was much softened. The lesion, in some places, extending to the depth of one inch into the white matter. Two drachms of clear fluid were found in the ventricles. Other portions of the brain healthy.

The heart was large, weighing 11 oz. Left ventricle much hypertrophied. Small vegetations on the aortic valves. Right lung much inflamed and hepatized. The spleen was much hypertrophied, weighing 2 lbs. 10½ oz. The liver was somewhat mottled on the surface; kidneys large; other organs healthy.

Microscopic Examination.—The softened cerebral substance surrounding the clot contained exudation corpuscles and granules. Large exudation masses were also found coating and lying between the vessels.

Remarks.—How different are the symptoms in this case to those recorded in the last observation. Here, also, an apoplexy followed by hemiplegia was occasioned by an extravasation of

blood. It was, however, not larger, but acted apparently as an irritating body, producing at a later period inflammation around it. After a time the same symptoms that we have previously so often noticed connected with cerebral inflammatory softening were developed, including rigid contraction of the inferior extremity, and after death numerous exudation corpuscles, masses and granules were found in the softened portions surrounding the clot. In this instance death took place a month after the apoplectic attack, and the softening extended deep into the brain. In Obs. XII. a similar lesion, with the same histological appearances were found. Death took place five weeks after the apoplectic attack, but no contraction or rigidity of the limbs were observed. In that case, however, the man had been only ten days in the Infirmary, and some of the symptoms might, therefore, have escaped observation. Moreover, the softening surrounding the clot was comparatively trifling, and the exudation corpuscles, masses, and granules not so numerous.

Obs. XXV.—Arm torn off by machinery, with laceration of the shoulder; trismus; opisthotonos; death four days after the appearance of the tetanic symptoms; blood extravasated within the spinal column, external to the dura mater; softening of the spinal cord in its dorsal portion; absence of exudation corpuscles or granules.

Thomas M'Ewan, aged 18, admitted into the Royal Infirmary under Dr Duncan, December 7, 1842. About five hours before admission this lad's right arm was entangled in the machinery of a paper-mill. The arm was torn off, the humerus giving way a little above its middle. The stump left was of a conical form. The muscles were much lacerated, and the skin extensively torn from the shoulder. The divided humeral artery and nerves were found among the lacerated muscles, the former firmly closed by a firm clot. The state of the parts was such as to render amputation inadvisable, as no sufficient covering could be procured from the extensive laceration. The patient had also lost a considerable quantity of blood; the surface was exanguine; he talked incoherently, and the pulse was soft, compressible, and fluttering. It was determined, therefore, to see what the powers of nature could perform, deferring any attempts at improving the state of the stump by removal of any part of it, until the suppurative stage had terminated. (Stump enveloped in lint, steeped in warm water, opiates and antimonials.) December 19th, Up to yesterday the patient continued to do remarkably well. Suppuration was fairly established in the stump, the sloughing was inconsiderable, and the discharge was healthy; the constitutional symptoms were relieved; the appetite returned; the pulse ranged from 90 to 110. Last night he complained of some difficulty of swallowing. This morning he was unable to open the jaws to their full extent. At the visit the teeth of both jaws could only be separated to the extent of one inch and a-half. The

head was held in a constrained position from rigidity, which existed in the muscles of the neck. (Purgatives, opiates, tobacco enemata.) In the evening he had several startings of the stump, which caused him to scream out. December 20th, The jaw can now scarcely be opened in any way, and the rigidity of the neck is increased. During the night has had several twitchings of the stump, and injured his tongue no less than seven times, causing him to scream out. The surface of stump has taken on an unhealthy aspect, the healthy granulations have disappeared. Several sharp spiculæ of bone were removed. Rigidity of jaws and neck continues; countenance contracted; *risus sardonicus*. (Quinine and morphia.) December 21st, Passed a more tranquil night. This morning had a violent spasm, during which the head and trunk were drawn backwards. There were also dyspnœa. A similar spasm occurred in the evening. During the night the spasm became more frequent, and assumed all the characters of complete opisthotonos. He expired during a violent spasm betwixt 11 and 12 A. M. on the 22d.

Sectio, December 24th.—The brain was healthy. On laying open the spinal cord, a mass of coagulated blood, partly decolorized, was found extending over a considerable portion of the dorsal region external to the *dura mater*. On dividing this membrane the spinal cord presented no appearance of disease, with the exception of a circumscribed swelling in the lower portion of the dorsal region, which, on section was found of a pultaceous consistence. The extremity of the median nerve on the stump, where it had been torn across, was somewhat thickened and swollen. The other internal organs were healthy, with the exception of the bronchi, which contained a considerable quantity of mucus.

Microscopic Examination.—The varicose tubes of the spinal cord where it was softened were readily separated from each other by pressure. Many of them were broken down, forming the globules with double lines, similar to those observed in Obs. XXI. Other portions of the cord, previously ascertained to be healthy, were, by my friend, Dr Peacock, mechanically broken up with the scissors, so as to produce a pulpy softening, and when examined microscopically presented the same appearance. No exudation corpuscles or granules were to be seen.

Remarks.—This case of tetanus differs from that of Obs. XVI. in being traumatic and more acute. There was here also an extravasation of blood between the bones and *dura mater*. Was this extravasation in any way connected with the production of tetanus? It is curious, however, that in this instance also softening of the spinal cord should have been found. In the remarks appended to Obs. XVI., I stated that the softening was most probably the result of *post mortem* violence employed in opening the spinal column. In the present case another portion of the spinal cord was mechanically broken up, in order to determine whether similar softenings could thus be produced. The result was, that,

when examined by the naked eye, or by the microscope, they appeared identical. This circumstance, with the absence of exudation corpuscles and granules, leave little doubt in my mind that the circumscribed softenings so frequently recorded as the proximate cause of tetanus, have, in point of fact, never existed during the life of the individual. In the same manner may probably be explained those marvellous cases where the individuals have preserved the perfect use of their inferior extremities, notwithstanding extensive softening of the cord.*

II.—OBSERVATIONS CONNECTED WITH LESIONS OF THE NERVOUS CENTRES, DETECTABLE ONLY BY MEANS OF THE MICROSCOPE.

For striking examples of the existence of inflammation in the brain, without its being detectable by ordinary sight, I refer to Obs. IV., XX., and XXII. In those instances, however, more evident lesions were also present. In the following cases no morbid change whatever could be found in the brain.

Obs. XXVI.—*Acute hydrocephalus ; death ten days after the commencement of the disease ; nothing anormal in the brain ; vessels of the convolutions abundantly coated with exudation granules.*

John Smith, aged 3 years, admitted into the Royal Infirmary under Dr Traill, February 12, 1842.

According to the mother's account, he awoke during the night of the 3d instant with a loud scream, and, by pointing to his head, seemed to indicate that he felt pain there. On the following day he vomited repeatedly, and he has since refused all food. On admission there was constant rolling of the head ; pupils contracted on the approach of light ; pulse quick and sharp ; bowels regular. Two leeches to the head ; powders of calomel and sugar.

February 13th. Vomited powder ; passed a restless night ; some tremor observed in the limbs. Blister to the head ; clyster ; became restless, and died during the night.

Section, February 15th.—The membranes covering the brain displayed no unusual vascularity. The ventricles contained no fluid, nor was the consistence of the cerebral substance in any way altered.

Microscopic Examination.—The vessels of the convolutions were in many places slightly coated with exudation granules. The fornix and central medullary parts of the brain presented a similar appearance. The coating of granules here, however, was frequently two, and even three times thicker than the vessel to which it was attached, and contained here and there clear, round, white spots, similar to the nuclei of the exudation corpuscles. See Plate I. Fig. 4.

Remarks.—This case presented the usual symptoms of acute

* See Lib. of Prac. Med. Vol. vii. p. 287.

hydrocephalus in children, yet after death no morbid lesion of any consequence was to be discovered. This is a circumstance of by no means unusual occurrence. A more minute examination, however, determined that the capillaries of the central substance of the brain were coated with exudation granules to a very great extent, and that these granules contained among them numerous bodies similar to the corpuscular nuclei. That the exudation in this case should have presented this condition, notwithstanding the violent symptoms, is very curious, and, in an histological point of view, exceedingly interesting. It furnishes us with an intermediate stage in the development of the exudation corpuscle, as seen in many of the preceding cases on the one hand, and those which are to follow on the other.

Obs. XXVII.—*Delirium tremens; death; slight subarachnoid effusion; brain otherwise healthy; capillary vessels throughout the gray substance of the convolutions, partially coated with exudation granules.*

William Johnston, aged 26, a tavern waiter, a strong muscular man, admitted into the Royal Infirmary, March 6th 1842, under Dr Craigie.

For the last three years he has seldom gone to bed sober, and during the last six months, he has frequently been intoxicated during the day. Ten days ago he was dismissed from his situation. Last night he was found by a policeman in the street, in a state of great excitement, and brought to the hospital in the morning. On admission there was much agitation, and constant tremor of the hands. The face was flushed, the surface bedewed with perspiration, and on the legs and arms were numerous ecchymosed spots, the result of external violence. There was increased sensibility of the surface, and a tendency to move from one place to another. Tongue foul; pulse frequent. This is the first attack of *delirium tremens*, but he has often had fulness of the head, flushed face, and injected conjunctiva, for which he has frequently been bled with relief. (*Calomel. gr. iv. Pulv. Jalap. ʒi. enema.*) In the evening he became delirious, speaking to guests in the tavern, &c. March 7th, The head symptoms are more intense. (*Antim. Tart. 7½ grains; head to be shaved and cold applied.*) In the afternoon the countenance became livid and haggard, and the delirium increased. In the evening slept a little, and the hands were not so tremulous. Died on the morning of the 8th.

Sectio, March 10th.—Some degree of subarachnoid effusion, but not sufficient to elevate the membrane above the convolutions. The brain on section was firm, with rather more red dots than usual. No appreciable amount of fluid in the ventricles; the choroid plexus was congested; a small quantity of effusion existed at the base.

The lungs were voluminous and congested; the heart was large, and weighed 13 ounces. There was slight thickening of the mitral and aortic valves; the coats of the stomach were healthy. The

liver was large, of a yellowish colour and granulated appearance, with the lobules distinct. The kidneys were healthy ; spleen small.

Microscopic Examination.—I made a most careful examination of this brain. Throughout the gray substance of the convolutions covering both the cerebrum and cerebellum, the capillaries were partially coated with exudation granules. This appearance was nowhere to be detected in the white substance. See Plate I. Fig. 5.

Obs. XXVIII.—*Delirium tremens ; death in 13 days ; slight effusion into the subarachnoid cavity and lateral ventricles ; capillaries of the convolutions partially coated with exudation granules.*

William Davidson, aged 37, a strong and powerfully-built man, admitted into the Royal Infirmary, April 7th, under Dr Spittal.

For two years this man has been connected with a brewery, and taken habitually two and a-half bottles of ale per day. To this he has occasionally added a gill of whisky, and sometimes drunk to perfect intoxication. Eleven days before admission he omitted to take his usual draughts, and he complained of general exhaustion, loss of appetite, and mental confusion. These symptoms continued to increase, and within the last two days, tremors of the extremities have been superadded. On admission the face was flushed, temperature of the surface normal ; slight injection of the conjunctivæ ; trembling of the lips and extremities. Answers questions confusedly, but no decided delirium. Tongue clean ; pulse between 70 and 80, full, and of good strength ; bowels open. (Calomel and colocynth pills ; *Antim. Tart.* gr. iv. and *Sol. Morphine* ℥ii. every hour.) In the evening he became very restless, and was covered with a profuse perspiration. Cold douche to the head. April 8th, During the night he became violent, and laboured under hallucinations of something attacking his face. Towards morning he became more tranquil. At the visit the pulse was 135, soft ; tongue slightly foul ; muttering incoherently. Slept in the afternoon for five hours ; in the evening became drowsy. Sordes collected on the teeth and gums. Turpentine enema. Died April 9th.

Section, April 11th.—Subarachnoid effusion and venous engorgement on the surface of the hemispheres. On slicing the brain numerous bloody points appeared in the medullary portion. There were ℥iiss. of transparent fluid in both lateral ventricles, besides a considerable quantity collected at the base. Pleural adhesions of both lungs ; heart enlarged ; the mucous membrane of the stomach was readily separated ; liver and kidneys engorged with blood, otherwise healthy.

Microscopic Examination.—Almost the same appearances as were described in the last case.

Obs. XXIX.—*Cerebral typhus ; delirium ; coma ; death on the 14th day ; effusion of serum into the ventricles, otherwise nothing abnormal ; vessels of the convolutions partially coated with exudation granules.*

Mrs Spence, aged 36, admitted into the Royal Infirmary, March

10th 1842, under Dr Traill. A week previous to admission she was seized with pains in the head and back, violent shivering and weakness of the joints. Has had no vomiting. On the evening of admission she had considerable delirium; the abdomen was tense, with pain on pressure; she passed no urine, and a small quantity was drawn by the catheter. The eyes were suffused; bowels open; tongue brown and furred in the centre; skin dry; pulse small and quick. March 12th, Eyes still suffused; the tongue is very dry and brown in the centre; skin hot; no urine is secreted, none passes on introducing the catheter; can bear pressure in the hypogastrium. March 14th, The hearing is very dull; skin cool; pulse feeble; tongue dry; passes urine freely. March 15th, Some confusion of the intellect. March 16th, Last night considerable stupor; pulse very feeble. March 17th, Pulse feeble; coma profound; sordes on lips and teeth. Died.

Section, March 19th.—Slight effusion below the arachnoid; ventricles filled with serum; small cysts in the choroid plexus; otherwise nothing anormal.

Microscopic Examination.—The capillary vessels in the gray matter of the convolutions were lined with exudation granules, here and there in patches, but to no great extent.

OBS. XXX.—*Cerebral typhus; delirium; coma; death on the 14th day; slight extravasation of blood on the dura mater; slight effusion of serum into the subarachnoid cavity and lateral ventricles; capillaries of the convolutions partially coated with exudation granules.*

Widow M'Conochie, aged 52, admitted into the Royal Infirmary, February 10th 1842, under Dr Craigie. For six months previous to admission she has been labouring under debility and boils in the back, which she ascribes to want of food. On entering the house she laboured under headach, vertigo, sickness, and general prostration. These symptoms disappeared in a week. Fourteen days previous to her death febrile symptoms again made their appearance, accompanied with marked head affection. There was violent delirium for ten days, latterly sinking into low muttering. There was an abundant typhoid eruption. During the last two days she became comatose, and the evacuations were passed involuntarily. Died at 10 A. M., March 25th.

Section, March 26th.—On elevating the *dura mater* its inferior surface displayed a thin coating of coagulated blood. There was considerable subarachnoid effusion, and numerous red dots on slicing the brain. Three drachms of fluid in both ventricles, otherwise healthy.

Microscopic Examination.—Many of the capillaries in the convolutions, covering the superior portion of the hemispheres, were coated with exudation granules.

OBS. XXXI.—*Erysipelas of the head; delirium; brain apparently healthy; exudation granules coating the capillaries in the gray substance of convolutions.*

George Wardlaw, aged 38 ; admitted into the Royal Infirmary, August 17th 1842, under Dr Paterson. On admission he was found labouring under erysipelas of the head, for which he had been bled. August 19th, Passed a restless night, with raving ; he was also noisy and violent. The delirium increased during the night, and he was again bled. Died 4 A. M. on the 20th.

Section, August 21st.—The arachnoid was slightly elevated by fluid at the posterior part of the hemispheres. Some turgescence of the external hemispheres ; substance of the brain unusually firm ; very little fluid in the ventricles or at the base ; other viscera healthy.

Microscopic Examination.—The same appearances were found as in the last case.

Remarks.—The same observations apply to the five preceding cases, and to numerous others which I have not thought it necessary to give in detail. In all there was considerable mental excitement or delirium, terminating in coma and death ; and in all the capillaries of the convolutions were found more or less coated with exudation granules. I have no doubt that this appearance is the commencement of the more evident lesions resulting from inflammation, and it is probable that the symptoms in such cases are referable to the extension, rather than to the intensity of the morbid process. Such appearances, however, are very common in the brain, and when we consider that, in the majority of individuals, either slight delirium or coma precede death, we may readily understand how, in such cases, slight exudation is likely to arise from any vascular congestion which may, under such circumstances, take place.

Before proceeding to discuss the pathological conclusions which may be drawn from the foregoing observations, it will be well to describe the physical properties and mode of formation of the minute structures which have so often come under review—that is, so far as the numerous examinations I have made will enable me to determine them.

ON THE PHYSICAL PROPERTIES AND MODE OF FORMATION OF THE EXUDATION CORPUSCLE.

This subject may be described under the heads of, *1st*, The effects of pressure and friction. *2dly*, The effects of chemical reagents ; and *3dly*, the theory of its formation.

Effects of Pressure and Friction on the Exudation Corpuscle.—On gradually pressing the perfect corpuscle, either with the hands between slips of glass, or by means of Chevalier's compressor, large drops like oil may sometimes be made to appear within the cell wall, or to exude through it, which subsequently becomes

more or less collapsed, (Plate I. Fig. 7.) At others the cell is thus ruptured, and the granules escape. Sometimes one globule is thus separated, which is apparently of more dense materials than the other granules, leaving a white spot in the corpuscle, (Fig. 8, a.) On employing strong friction, the granules may be dispersed, but the separated globule remains for a considerable time unaffected, and occasionally it is impossible to break it down, (Fig. 8, b. c.)

2. *Effects of Chemical Reagents on the Exudation Corpuscle.*

—It is difficult to determine the effect of chemical reagents on corpuscles, when they are found in a soft adhesive mass like that of brain. When they exist in fluids, as in blood or purulent matter, a drop of any chemical reagent mixes readily with it, and its effects can be easily ascertained. Or a thin glass may be laid over the fluid examined, and a drop of the reagent placed upon its edge, as Mandl advised. In this way the latter gradually diffuses itself through the former, and the effect may be observed with great accuracy. Neither method, however, can be adopted where the tissue is dense or thick. The cells must then be separated and kept apart in water. When the nervous substance is softened, this is readily accomplished, by shaking in a test tube a small portion of the morbid structure with water. In this way a turbid milky fluid is produced, on examining which under the microscope, it is found to contain numerous fragments of nervous tubes, granules, globules with double lines, oil globules, and exudation corpuscles. The latter are seen apparently unchanged, rolling freely, and continually turning round in the fluid. Chemical reagents now added, come into immediate contact with the corpuscle, and its effects can be readily ascertained.

Water produces no change in these bodies. The cell wall appears loose and flaccid, and the whole rolls freely over and over, showing its continuous structure, and the granules contained within it.

Acetic acid sometimes produces no change; at others the cell wall is rendered a little more transparent, but this has often been so slight and undetermined as to preclude making a positive statement to this effect.

Solutions of nitrate of silver and chromic acid, (3j. to 3ss.) cause the albuminous matter of the brain to coagulate in dense opaque masses. The corpuscles are contracted; their form is rendered irregular; they become more opaque, and their edge more distinct and thick.

Liquor ammoniæ causes the corpuscle to dissolve gradually, and enables it to be readily broken down, and the granules dispersed by friction.

Liquor potassæ entirely dissolves the corpuscle, leaving no trace whatever of its existence.

Sulphuric æther in excess also dissolves the corpuscle, leaving behind an amorphous mass.

3. *Theory of the formation of the Exudation Corpuscle.*—Gluge was the first to point out, not only in softening of the brain, but that, in certain stages of inflammation generally, corpuscles are produced, which he has denominated compound inflammation globules. He observes, "Under certain circumstances, the blood in the capillary vessels stands still, and the blood globules are changed in the following manner, as I have directly observed with the microscope. They lose their coverings and colour, only their nuclei remain. These, however, do not remain isolated, but become agglomerated by means of a white connecting mass, and form thick, opaque, round bodies, which consist, on an average, of from twenty to thirty small granules, which, when examined singly, are perfectly clear and transparent. By pressure, as well as by the action of acetic acid, the granular bodies are broken up, and we are enabled to see that the opacity depends on their agglomeration. The longer granular bodies have a diameter of from $\frac{1}{30}$ th to $\frac{1}{20}$ th of a millimetre, the single granules from $\frac{1}{40}$ th to $\frac{1}{30}$ th of a millimetre. This measurement corresponds with that of the blood nuclei. These agglomerated bodies I have directly seen in the vessels, so that we have not here to do with a fluid, which first exudes through the walls of the vessel, and thus changes into granules." He further observes, with respect to softening of the brain, "that the effused serum of the blood produces a true maceration of the cerebral substance. Later the capillary vessels are torn, and the agglomerated bodies are then found in the parenchyma of the affected organs."*

It is singular, that, whilst Gluge has accurately described the granular structure and size of these bodies, the existence of a nucleus and cell wall should have entirely escaped him. Henle, however, states that these globules are surrounded by a membrane containing the granules and a pale nucleus. He points out that they most resemble pigment cells; that corpuscles so large cannot form in the capillary vessels, and is led to consider them identical with those cells he has denominated primary.† In this opinion both Valentin‡ and Vogel§ seem to concur, and it must be evident, from the observations previously detailed, that this is the correct view. Gerber does not seem to have noticed these bodies. He speaks, indeed, of exudation corpuscles, but neither from his description or figures can we suppose that he refers to the bodies found in inflamed parenchymatous tissues. He evidently alludes

* Anat. Mikroskopische Untersuchungen, pp. 12, 13.

† Muller's Archives, 1839, p. 24.

‡ See Vogel, ueber die Erweichung des Gehirns, p. 72.

§ Wagner, Handwörterbuch der Physiologie, Art. Entzündung.

to the corpuscles found in the plastic lymph, produced on the surface of serous membranes, which, in my opinion, is a different structure, and has no connection whatever to the bodies now under consideration.*

From the different microscopic examinations I have detailed, the mode in which the exudation corpuscles is developed may readily be deduced. The blood *plasma*, or *liquor sanguinis*, which exudes through the walls of the blood-vessels, after a time, which may be shorter or longer, according to circumstances, coagulates in the form of minute granules. These may be seen coating the vessels, and filling up the spaces between them in masses more or less dense. If a small quantity only be exuded, the granules occur in small patches at irregular intervals, as in Obs. XXVII.—XXXI., Plate I. Fig. 5. This appears to arise from a comparatively slight degree of congestion, which, however, may produce very intense symptoms from its diffusion over a large surface, as in cases of fever, delirium tremens, &c. When, on the other hand, the congestion is more intense in certain places, the exudation is more abundant, and the granules accumulate in a dense mass outside the vessels, or in the interstices of the elementary structures of the organ, (Plate I. Fig. 4.) This exudation serves as a blastema for the production and nourishment of nucleated cells. These may either be formed directly from the fluid *liquor sanguinis*, or subsequent to its coagulation. In the former case they may be seen coating the blood-vessels, (see Journal, No. 153, Plate 5, Fig. 6,) in the latter imbedded in the granular solid mass, (Plate Figs. 7 and 8.) In parenchymatous tissues, where the whole exudation passes into solid coagulation, it is the growth and development of these corpuscles which causes it to break up, and gradually to become more and more soft. Thus we have uniformly seen that when the softening is diffuent, perfect corpuscles are few, and that the granules are numerous and loose; when it is pultaceous only the corpuscles are numerous, and the granules less so, and when the diseased part retains to a considerable degree its resistance, or is unchanged, the corpuscles are few, whilst the granules, instead of floating loose, are attached to, and coat the blood-vessels. During the progress of disintegration, it frequently happens that portions of the solid exudation are broken up into masses of greater or less size, which are frequently seen of irregular shape, both attached to the vascular walls, and floating loose in the field of the microscope.

The exudation corpuscle is formed like all other primary cells, a nucleus is produced, from which a cell wall arises. During, or subsequent to its full growth, granules are formed between the nucleus and cell wall. These become more and more numerous,

* Gerber's Elements of Anatomy, p. 83.

until at length the nucleus is obscured, and the whole cell appears full of, and distended with granules. It presents different appearances at different periods of its growth. At an early period it is very delicate and transparent; the nucleus is very distinct, like a white spot, and the granules exceedingly minute, and few in number. As the development proceeds, the granules become larger and more numerous, the corpuscle assumes a brownish colour, and becomes more or less opaque. Sometimes it entirely obstructs the rays of light, and looks black. In the observation where the softening resembled chalky milk, the whole cell was full of granules, of a large size, each of which were perfectly round and transparent, (Plate I. Fig. 1.)

When the exudation corpuscle is distended with granules, it appears to have reached its furthest stage of development, the cell wall now bursts, and its contents escape, (Plate I. Fig. 9.) This occurring in numerous corpuscles, causes the coagulated exudation to become soft, pultaceous, or even diffuent. When, by the process of organization thus described, the exuded mass is broken down, it appears probable that the minute granules or molleculæ, of which it now principally consists, may be reabsorbed, the structures of the organ set free from the pressure the exudation produced, and thus the part return to a healthy state. Gruby tells us that he has seen the molleculæ thus produced by the breaking down of pus cells, permeate the coats of the intermediary and capillary vessels, and mix with the blood.* This is the process by which it seems probable that hepatization of the lungs is removed. It is impossible, however, to know with certainty whether a similar process takes place in the brain, because the symptoms of exudation into that organ are by no means so unequivocal, but it is highly probable. More generally, however, absorption either does not take place, or is not in proportion to the amount of exudation poured out, and the ultimate structure of the organ is also at length broken up and disorganized. Thus, when inflammatory softening of the brain is diffuent, not only is the exudation mass reduced to granules, but the cylindrical and varicose nervous tubes are broken up into fragments more or less long.

Dr Henderson, in an interesting paper on pneumonia,† was the first to point out a distinction between the different granular bodies resulting from exudation, as he had observed them in inflamed lungs. He says, "they do not always present in their agglomerated form the figure described by Gluge, but are variously shaped according to the state of perfection in which they may happen to be. While some are globular, and exhibit a circular outline, others appear deeply indented and defective, as if a portion of their substance had been removed; and others have nothing of

* Obs. Microscopica, p. 55.
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† Lond. and Ed. Monthly Journ. October 1841.
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their original round figure remaining." I think it will appear that these differences do not arise from the stages of development of the exudation corpuscle, as Dr Henderson supposes, but are caused by the coagulated blood-plasma breaking up into different sized masses. I have frequently, by means of friction, caused such portions of coagulated exudation to separate, to peel off, as it were, from the exterior of the vessels, and float loose amongst the granules and corpuscles. These bodies I have distinguished by the term exudation *masses*.

We have seen that softening has probably been present for several months, and yet, on examination, the same perfect corpuscles have been found as when the lesion only existed a few days. Now, are we to suppose that exudation has been proceeding all this time, that new corpuscles are continually produced and developed, and their granules absorbed? On the other hand, are we to conclude that in these chronic cases the corpuscles do **not** originate only from the exuded *liquor sanguinis*, but are reproduced by the granules escaping from the parent cell, in the manner known to take place in similar organisms? This point is undoubtedly a difficult one to decide, for we have no means of judging from actual inspection in the animal textures whether such cells have the power of reproduction, or whether their life terminates with the rupture of the cell wall. Judging from analogy, however, I am inclined to consider the latter the most probable view, because, did reproduction proceed from the granules contained in each primary cell, the amount of morbid tissue would be very considerably increased, which is what we never observe in connection with exudation corpuscles.

There is another point in connection with my observations which, it appears to me, deserves attention. We have seen that pressure causes globules, like those of oil, to exude through the cell wall, and that, from the application of chemical reagents, it would appear that oily matter enters largely into the constitution of those exudation corpuscles. Dr Ascherson was the first to point out the important part played by oil in the formation of every organism,* and that it enters largely into the constitution of every primary cell and tissue is a well-known fact, and may be readily demonstrated. Whether every cell is, as he supposes, formed by the union of oil and albumen, however probable, is still a matter of question. No doubt these chemical principles enter largely, not only into the constitution of the elementary tissues, but into the products of inflammation, as in purulent matter, lymph, &c. That they are essential to the process of nutrition is well known. There can be no doubt, also, of the fact pointed out by Ascherson, that fluid fat or oil brought into contact with albu-

* See the writer's Treatise on the Ol. Jecoris Aselli, p. 53, et seq.

Fig 1.

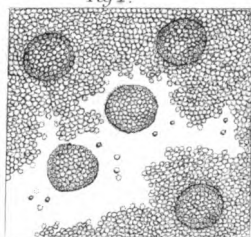


Fig. 2

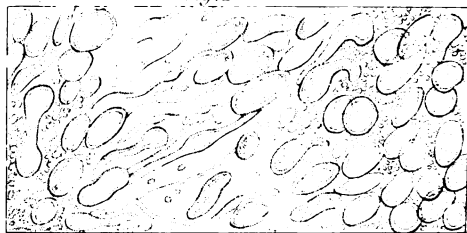


Fig. 3

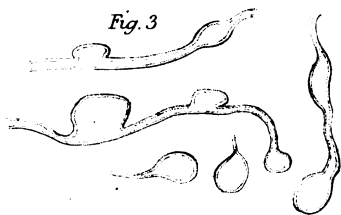


Fig. 4

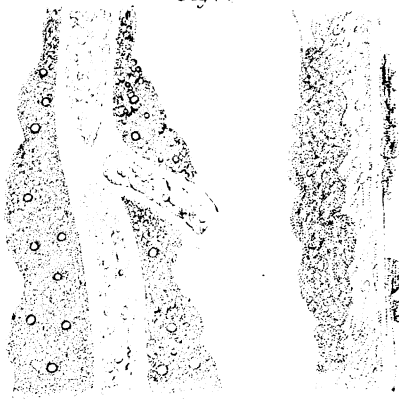


Fig. 5

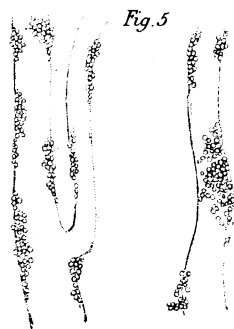


Fig. 6.

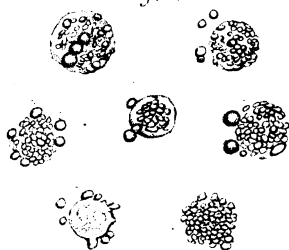


Fig. 7.

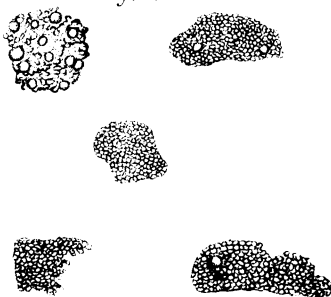
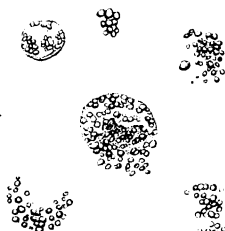


Fig. 8.



Fig. 9.



men, causes the latter to coagulate. Now fluid fat exists in various proportions in all the textures; in the brain we know it to be very abundant. May we not therefore suppose that it is the presence of the oil in living tissues which causes the fibrin and albumen of the blood to assume the granular form which we have uniformly seen to exist in inflammatory exudation? Many facts and arguments might be brought forward in support of this hypothesis; but I forbear entering upon a view which, in the present state of science, must be regarded as altogether speculative.

(To be continued.)

EXPLANATION OF PLATE I.

All the figures represent structures, as seen under a magnifying power of 300 linear diameters.

Fig. 1. Exudation corpuscles and granules, as seen in the softening resembling chalky milk. (Obs. XVII.)

Fig. 2. Varicose tubes broken down, constituting globules with double lines. (Obs. XXI.)

Fig. 3. Varicose tubes, with the varicosities much enlarged. (Obs. XX.)

Fig. 4. Vessels extensively coated with exudation granules. (Obs. XXVI.)

Fig. 5. Vessels slightly coated with exudation granules. (Obs. XXVII.)

Fig. 6. Exudation masses, some containing transparent globules, resembling nuclei or drops of oil.

Fig. 7. Exudation corpuscles, showing the effects of pressure.

Fig. 8. A nucleated exudation corpuscle gradually broken down by strong friction.

Fig. 9. Different exudation corpuscles after being fully developed. The contained granules are discharged, and the cell wall disappears.

ART. VIII.—*Case of Excision of the Lower Jaw, in which both lateral portions of the bone have been removed, leaving merely a small portion at the symphysis.* By JAMES SPENCE, Surgeon, Member of the Medico-Chirurgical and Anatomical Societies of Edinburgh, and one of the Teachers in the School of Anatomy, No. 1 Surgeon's Square.

My principal reason for publishing the following case is, that it is the only one, as far as I am aware, in which both lateral portions of the inferior maxilla have been removed, leaving merely the symphysis of the bone remaining, and hence I considered it might be interesting to the profession.

The first operation on the patient whose case is the subject of the communication, was performed by Mr Fergusson in 1836; and, through the kindness of that gentleman, I am enabled to commence the history of the case with his report.

“ Mrs Fitzpatrick, aged 46, received a blow on the right side of

the lower jaw several years ago, and since then various small portions of bone have been discharged from time to time. A tumour has gradually formed on the bone between the angle and the chin, and has since attained the size of a hen's egg, its growth having increased rapidly within the last five months. There is no particular pain in the part, but it now begins to annoy her from its size. On the left side the alveolar processes are somewhat thickened, and the teeth on both sides are very deficient, only a few stumps remaining.

"With the concurrence of Sir George Ballingall, Mr Nasmyth, and others, I removed the tumour on the right side on the 12th of March 1836, having divided the bone behind and a little above the angle, and in front a little anterior to the mental foramen. The wound healed kindly, and a firm cicatrix formed in the mouth between the divided ends of the maxilla. I used occasionally to see this patient afterwards, and observed that the swelling on the other side was gradually increasing. Several sections were made of the part which had been removed, and each surface presented a smooth dense aspect of a homogeneous character throughout. The deposit of new structure had seemingly taken place between the alveoli and the maxillary canal, as the latter part had been pushed downwards until it had reached the external plate of bone on the lower margin of the jaw. There was no soft point in the growth, and nothing to indicate malignancy." Such is Mr Fergusson's history of the patient whilst under his care.

I first examined this patient in August last, at the request of Mr Lawrie, to whom she had applied for advice. She at that time complained of great pain in the remaining portion of the jaw, a little in front of the angle of the bone, and on examination, a hard tumour, about the size of a large walnut, flattened, could be felt situated in front of the angle of the jaw.

Her own history of the disease was similar to that given by Mr Fergusson, except that she stated that a piece of bone had been discharged from the left as well as from the right side of the jaw, and that the tumour for which she now consulted me had existed for about five years before the former operation was performed. As she stated that the tumour was enlarging, that the pain had of late become more violent, and as her health was sinking from the want of rest and continued suffering; and as, judging from the firm feel and previous history of the tumour, it did not seem malignant, I recommended her to have it removed. To this, however, she could not then make up her mind to submit. In the end of September, I was again requested to see her, when the pain had become so violent that she said she would submit to anything that would relieve her. I showed the case to Sir George Ballingall,

Professor Syme, and Mr Nasmyth, and these gentlemen coincided with me in recommending an operation. Professor Syme mentioned that the patient had been under his care about ten or eleven years ago for a swelling on the left side of the jaw, resulting from an injury; and some sequestra had been discharged; under these circumstances he considered it would be prudent to lay bare the tumour and saw out a portion, to make sure of its exact nature before proceeding to remove the jaw, as it was possible the swelling might depend upon the presence of an internal sequestrum.

I performed the operation on the 20th of October last, in presence of Sir George Ballingall and several medical friends, and assisted by Drs Handyside, Duncan, and Mr Nasmyth. Entering the bistoury in front of the insertion of the masseter muscle, I transixed the membrane of the mouth, carried the knife forward along the bone and cut outwards, dividing the prolabium and other soft parts a little to the left of the symphysis, and thus at once formed a flap which laid bare the tumour, and enabled me to apply the saw to it. Having ascertained its nature, and finding that its entire removal was necessary, I made an incision downwards from over the articulation of the jaw, terminating in the external end of the former incision. The semilunar flap so formed was then dissected up, the bone cleared from the soft parts on its inner surface, and sawn in front of the canine tooth. I then depressed the bone so as to enable me to divide the insertion of the temporal muscle, and completed the operation by disarticulating the lateral portion of the jaw; five arteries were tied, some slips of lint placed in the deep part of the wound, and the edges of the incision were then brought together by some points of interrupted suture, except at one point midway between the ear and chin, which was left open for the ends of the ligatures to hang out.

Every thing proceeded favourably; the external incision healed by the first intention except where the ligatures hung out. The slips of lint were removed from the deep incision on the third, and the patient was sitting up on the ninth day. The last ligature came away on the twelfth day. This ligature had been brought out at the upper part of the incision in front of the ear, and on its separation saliva continued to flow from the opening for some days, but it soon healed under the use of pressure, by means of a compress of lint applied over the fistulous opening.

It may seem at first sight of little use to leave the mere symphysis remaining, as, when deprived of the support of the lateral portions, it was as likely to be retracted along with the tongue as to prevent that occurrence. The reasons which induced me to leave that portion of the bone were, *1st*, that it would afford a better hold for the gentleman who assisted me, to prevent retraction during the operation; *2dly*,

That when the wound healed it would afford support to the lower lip, and thus in some measure prevent the constant escape of saliva; and that, as it would contract adhesions to the cicatrix, by preserving the attachments of the muscles of the tongue the patient would be enabled to speak and swallow better than if it had been removed; and *lastly*, by preserving somewhat the appearance of the chin, the operation would be followed by less deformity, and the patient rendered more comfortable; whereas, if the symphysis had been removed, the retraction of the lower part of the face would have been greater, the tongue would have formed adhesion to the fore-part of the lip, and thus from its pendulous position have given rise to a constant and profuse discharge of saliva, as was the case in the patient mentioned by Sir George Ballingall, and speech would necessarily have been very indistinct.

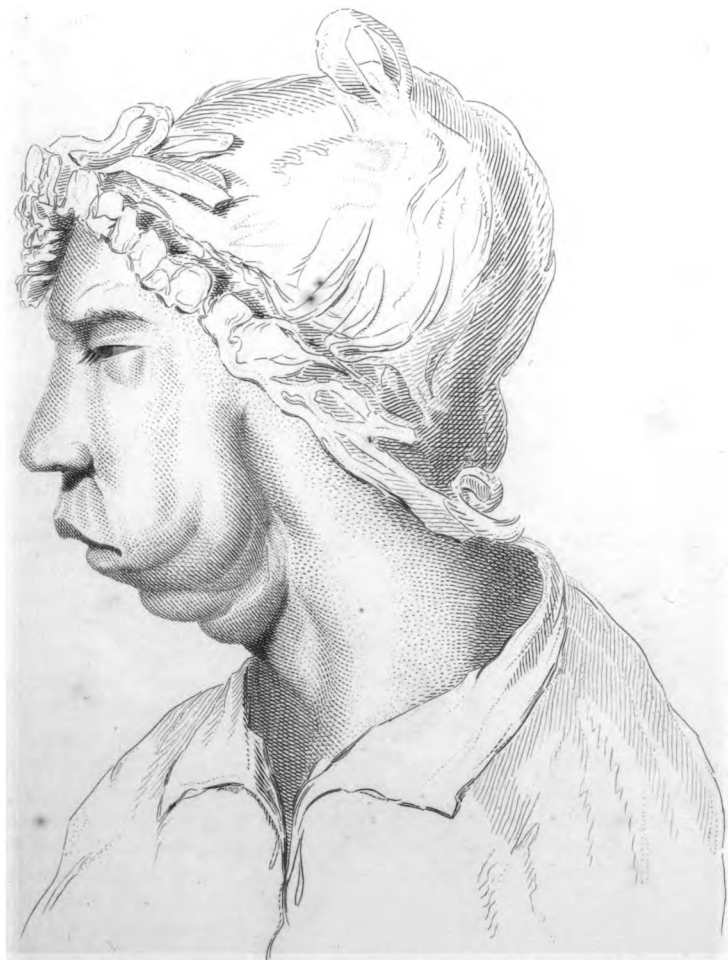
The result of the case has fully justified these conclusions; there has been no violent retraction of the tongue; the patient is able to speak as well as before the operation; she swallows easily, can shut and open the mouth, and protrude and retract the tongue readily. The escape of saliva when sitting up is very trifling, and is gradually becoming less.

A section of the jaw, made by my friend Mr Goodsir, shows the tumour to be of a dense solid structure except in its centre, where soft degeneration was apparently just commencing.

ART. IX.—*Case of Suicide by Arsenic fatal within two hours and a-half.* By ARCHIBALD DYMCK, M. D., &c.

SHORTLY before five P. M. of Thursday, February 2, 1843, an elderly woman, residing in the neighbourhood of my own house, called at the door, and implored my immediate professional attendance for her daughter, a young woman in her twentieth year, whom she had left that afternoon at three o'clock in good health, but had discovered, on returning home, in a state of serious and alarming illness. I accordingly repaired to her house without delay; and I shall now endeavour to present an exact detail of the situation of the sufferer, and of the symptoms with which she was then affected.

I found the unfortunate woman dressed in her night-clothes, writhing and tossing about in bed, making ceaseless but fruitless efforts, by change of posture, to alleviate her distress, moaning most piteously, occasionally retching, and exclaiming at brief intervals, "I am mortally sick—mortally sick." As it was very evident, from the violence and suddenness of the attack, that it was not to be referred to the operation of any ordinary cause of disease, and as the mental faculties were unimpaired, I considered it proper, in the first



Likeness of M^r. Spence's Patient, shewing the extent of retraction of the lower part of face, 3 months after the operation.

place, to derive from her own lips such information as might importantly direct and regulate the application of remedial agents. This, however, was repeatedly attempted in vain. I was, therefore, compelled to make use of physical control over her person, of which she exhibited great impatience, and under this restraint I extorted from her very reluctantly the following painful disclosure, which was fully verified by subsequent inquiry :—She stated that, on the preceding evening, she had bought a sixpence worth of arsenic (two ounces of the white oxide of arsenic in powder) from an apothecary, under false representations, and that, when her mother quitted the house at three o'clock, she had swallowed it all, and thereafter gone to bed, having taken the precaution, for the sake of concealment, to destroy the bottle, labelled “poison.” This confession afforded little reasonable ground for hope, which, indeed, was altogether extinguished so soon as I had time to examine into the condition of the system.

The face was flushed, and the countenance betrayed the most frightful expression of apprehension I ever remember to have witnessed. The conjunctiva was minutely injected, and around the cornea the ciliary vessels were so much enlarged as to imitate closely the appearance of the vascular zone in cases of acute iritis. The pupils were greatly dilated. The respiratory movements were small and frequent. The action of the heart was feeble and rapid. The extremities were quite cold and pulseless. The hands and lower half of both fore-arms were dark and livid, as in malignant cholera. On the surface of the skin lay a cold clammy sweat. Gentle pressure to the epigastrium seemed to cause uneasiness, as she hastily articulated “sore,” and thrust aside the hand.

Notwithstanding these unquestionable signs of near, nay impending dissolution, she maintained the same restless commotion for a period of more than twenty minutes after my arrival, invariably repelling every proffered service, and vigorously resisting each attempt to force her to swallow. After this she became quiet and composed. I then advanced to the bed with a candle, and raising the eyelid, brought the light close upon the eye, on which she pushed away my arm, and, having arranged her dress so as to hide the bosom, rose from bed, and walked unassisted to the fire-place, seating herself upon a chair. She had hardly done so, however, when, observing her slipping to the floor, I caught her in my arms, and with the help of her mother carried her to bed, where, after heaving one or two deep sighs, she expired without a struggle, and within two hours and a-half from the time of swallowing the poison.

Before entering upon the account of the morbid appearances, it is right to observe that, although there was merely retching during the last half hour, we had ample evidence of the pre-existence

of violent vomiting in the contents of a vessel where, amid other matters rejected from the stomach, was detected almost the entire quantity of arsenic originally purchased.

Inspectio cadaveris, forty-one hours after death, in presence of Dr Craigie, Dr Jackson, Dr James Weir, and John Macfarlane, Esq. There is neither fetor, nor any trace of incipient putrefaction. The stiffening of the whole body is well-marked, so much so that the rigidity of the muscles of the fore-arms has bent the fingers upon the palms, and started the tendons at the wrists. The face retains as freshly as in life its bright florid complexion, and the vessels of the eye remain injected. There is the same intense lividity of the hands and forearms, but there is no additional discoloration of this kind on any other parts of the body.

Abdomen.—The peritoneal surface of the stomach is normal. On opening this viscus, having previously secured its extremities by ligature, and removed it from the body, above a pound of a dullish-brown inodorous fluid was evacuated, in which floated numerous shreds and solid masses of coagulated mucus, having entangled within the white particles of arsenic. The inner coat is covered with a copious tough mucous secretion, and at various points are seen adhering to it the white particles, either separate or in small knots, though these are less abundant than might have been expected. The rugæ are numerous, prominent, and firm. Occupying nearly the whole of the anterior and lower portions of the great *cul de sac*, are extensive patches of a bright-scarlet colour. These decrease towards the centre of the stomach, where there are a few isolated red spots, but they reappear, and almost entirely cover the mucous membrane of the pyloric *cul de sac*. In some of these patches is observed a bruised or purplish appearance, as if blood had been extravasated from the over-distended and highly injected capillaries; but, on microscopic examination afterwards undertaken by Dr Allen Thomson, no actual escape could be discovered, the darker spots owing their purple hue to the gorged state of the veins in the substance of the mucous membrane itself, and to the enlargement of the venous trunks ramifying in the submucous cellular tissue. The injected state of the capillaries does not extend into the duodenum, nor is it met with in the rectum.

Thorax.—Both sides of the heart are empty; the left ventricle, from its firm tonic contraction, very much resembling the hardness of concentric hypertrophy. A few hours' submersion in water entirely effaced this state of the heart. There is no congestion of the lungs, which are light and natural in appearance.

Viewing this case apart from its moral aspect—an aspect which presents a young woman of a proud and sullen temper brooding over a paltry personal affront, and thereafter designing and exe-

cuting a wilful act of self-destruction, and, moreover, procuring the very instrument for accomplishing her wicked end, through a culpable facility on the part of others,—apart from this there are features of peculiar and prominent interest, both in a physiological and pathological light. These we may best contemplate in connection, successively, with the *local* and *remote effects* of the poison.

Local effects.—It is impossible to say when the poison first began to operate purely as a local irritant, since the individual had been nearly two hours alone; but we may pretty safely conjecture, that violent vomiting must have followed speedily, and lasted for some time, seeing that a large quantity of fluid matters, and nearly all the arsenic, were ejected previous to five o'clock. The more remarkable fact, however, relating to the local effects, is the amazing extent, not simply of irritation, but of strictly inflammatory action developed, conjoined to the extraordinary rapidity of death. Sir B. Brodie certainly states that he has seen the mucous coat of the stomach of the dog highly inflamed, where death took place in fifty-five minutes after injecting 3ii.; but Dr Christison lays it down as the general rule, as respects man, that, in cases of very rapid death from this poison, the local signs of irritation are scarcely appreciable; the exceptions which he gives being limited to four, viz. Gérard's case, where the irritant symptoms were wanting, and which proved fatal in five hours,—there was dark redness of the whole villous coat of the stomach; Mr Holland's case, fatal in eight or nine hours; and two cases by Pyl, one of which was fatal in ten, the other in three hours.

Remote effects.—Though one dare hardly assert that local irritation of the mucous membrane of the stomach, without perceptible organic lesion, caused by arsenic, may not also be accompanied by certain noxious nervous impressions capable of being transmitted to other organs, and materially interfering with their functions, many observations and experiments directly prove that no instantaneously fatal nervous impressions ever follow, even after large quantities of the poison have been taken, but that, on the contrary, a certain variable period always intervenes prior to the approach of the constitutional disturbance. We know, too, that the remote effects themselves, even in individuals of the same species, are not uniform. Why the affection of one organ should predominate in one case, and that of another organ in a second, is a problem difficult of explanation. In the present case, the remote effects were exclusively limited to certain functions of organic life; the animal functions,—consciousness, sensation, and volition,—were, to a wonderful degree, perfect up to the very last moment of life. The organic function which suffered was the circulation. Where, then, did the general and fatal depression of the circulation begin? Before solving this question, we shall premise

a few observations as to the probable mode in which the remote effects originate.

From the period of exemption above alluded to, we may conclude that, in all fatal cases, absorption of the poison to a greater or lesser extent has or may have taken place. On the present occasion, it is difficult to conceive how absorption could have been avoided, when we consider that the individual had been fasting for six or seven hours; that the arsenic was in the state of powder; that it amounted to the prodigious quantity of 960 grains; and that the fluid contained in the stomach after death, when separated from the solid matters and filtered, was found, on analysis, to yield an unusually large proportion of the poison.* It is to be presumed, then, that it is only after the poison has entered the circulation that its remote effects come to be displayed; and these are generally, as is well known, rapid prostration of the vascular powers, more especially of the heart's action, and sometimes, though more rarely, a state simulating narcotism. Now, such phenomena following the taking of arsenic cannot fail to impress us with the striking analogy which they bear to the results of various experiments by Legallois, by Flourens, by Wilson Philip, and, more particularly, by Chossat, which establish that certain physical injuries of the brain and spinal chord operate directly, through the intervention of the ganglionic system, either by very much enfeebling the action of the heart, or by entirely destroying it; or by chiefly affecting the circulation in the capillaries at the circumference of the vascular system, independently of any immediate action on the heart itself; or, again, by rapid extinction of all the powers of the circulatory system at once: And if, besides, we may at all rely upon the curious statement of Professor Marx, that Emmert had found that, "† of the various parts of animals poisoned with arsenic, the spinal chord and posterior part of the brain are alone fatal to other animals;" and couple it with the fact, that, in the animal economy, nature seldom accomplishes the same end by different means, we may, upon the whole, rationally draw the inference, that the remote effects of arsenic depend upon its first entering the general circulation, and through it acting upon the cerebro-spinal axis, causing, and perhaps accumulating, its pernicious impressions there, which are afterwards transmitted to, and affect the heart and blood-vessels much in the same manner as the effects of physical injury, but with less rapidity.

Having thus endeavoured to explain how the circulation is most probably arrested, let us revert to the question, where did the

* This was beautifully shown by my friend, Dr Douglas MacLagan, who, for the first time in this country, applied the new process of detecting arsenic by copper (Hugo Reinsch's) to an actual case of poisoning.

† I quote from the standard authority on toxicology, Professor Christison's *Treatise on Poisons*. It is proper to state, that Dr C. has not been able to discover the passage in any of the papers of Emmert.

circulation first fail in the case before us? And we are at once prepared to answer, that it primarily failed in the capillary system—at the extremity, so to speak, of the circulation; and that the heart's action came ultimately to be of little use, because it could not overcome the impediment existing in the arterial system; and because, from the altered distribution of blood, its supply of the vital stimulus came to be gradually lessened. To confirm the correctness of this view we solicit attention to the following facts. As characteristics of death beginning at the heart, we have, paleness of the surface, along with marked decrease of animal heat, great prostration of strength, syncope, obliteration of the functions of the sensorium; and we afterwards find the heart distended and full of blood—its irritability gone—the large blood-vessels leading to it gorged, and the lungs congested. Here, on the other hand, in place of paleness, the countenance was full and florid—there was the vivid injection of the vessels of the eye—the animal powers were exerted with great force to the last moment, implying integrity of the functions of the brain—the action of the heart, though feeble, remained perceptible; and after death the heart was found empty, and firmly contracted upon itself—the lungs being light, crepitating, and free from congestion. Contrasting, then, these two classes of opposing symptoms and appearances we have clear evidence that it was in the capillary system that the circulation first gave way, its area being subsequently narrowed towards its centre. And this satisfactorily accounts for several peculiarities in the case: *e. g.* the lividity* in the hands and arms may be regarded as a consequence of the propulsion of the blood by the *vis a tergo* through vessels deprived of their vital contractile power;—the action of the heart, being incompetent to overcome the obstruction in the more distant capillaries of the inferior extremities, is restricted to and concentrated upon those arteries which rise in its immediate vicinity, (the innominate, left common carotid, and subclavian,) and successfully combats for a time the mechanical hindrance. Hence, too, the minutely injected state of the arterial capillaries of the face and eye-balls, and the maintenance of the functions of the sensorium, which are at all times so directly dependent upon the transmission of arterial blood to the brain.

Retrospectively, then, we chiefly note the rare co-existence of violent local and remote effects, and death ensuing with a rapidity almost unexampled in the recorded cases of poisoning with arsenic; the shortest undoubted case upon record known to Dr Christison, being one narrated by Pyl, which was fatal in three hours.

* The lividity which takes place after death is the last exertion of the vital contractile power of arteries, and is best seen in those parts which longest retain their temperature, as on the back of the trunk and thighs. Its absence in this case corroborates the opinion, that the vital contractile power of the capillaries was extinct before the heart had ceased to beat.

19, Pitt Street, Edin. Feb. 20, 1843.

ART. X.—Observations and Cases illustrating the nature of False consecutive Aneurism of the Heart. By DAVID CRAIGIE, M. D., &c. Physician to the Royal Infirmary.

OF the diseases incident to the heart, some are so common and frequent, that they may justly be said to constitute a reasonable proportion of the mortality of the adults of the human race; and every practical physician has ample opportunities of witnessing their effects. To this class may be referred such diseases as cartilaginous, steatomatous, or ossific degeneration of the valves of the left chambers, and consequent arctation of the communicating apertures, hypertrophy of different sorts, and dilatation. Other lesions, again, are so rare and uncommon, that by many physicians no instance of them has been seen; and when they are seen, it has happened only to a few physicians to witness, perhaps, one single instance in the course of a long series of years. Of this we find a fine example in the lesion denominated aneurism of the heart, of which not many examples have been as yet distinctly recorded, and of which, it will subsequently appear, that not more than one single instance has occurred to each of several physicians engaged in extensive practice. One instance of this lesion, remarkable in differing from any one of those hitherto recorded, occurred to me in the course of the last winter; and it may therefore be interesting to give a short account of its peculiarities. It will further contribute to throw some light on the subject in general, if I premise some account of various cases which have occurred to other observers.

1. The first very distinct example of this lesion is recorded by Dominico Gusman Galeazzi, in the fourth volume of the Commentaries of the Bologna Academy; and is to the following effect. (Bononiæ 1757), p. 26. *Opuscula*.

A person of noble rank, whose mother had been liable to attacks of jaundice, became soon after marriage (the age is not stated) liable to acute pains under the sternum, for the relief of which he required blood-letting and the use of opiates, but by which, nevertheless, he was invariably attacked in subsequent years, so that the complaint became almost habitual. After some time two sorts of uneasy feelings assailed him. One consisted of pains referred to the upper or cardiac orifice of the stomach, very acute and less frequent in attack, and were accompanied with vomiting, debility, feebleness, and complete failure of the pulse, and remarkable coldness of the extremities. Others referred to the right hypochondriac region were dull or less acute, more constant, and unattended by vomiting and debility. To these, however, was added an uneasy sense of pain at the lower end of the sternum near the ensiform cartilage, which was so obstinate and continual, that several of the physicians consulted inferred the existence of a gall-

stone sticking in the neck of the gall-bladder. For twenty years he continued subject to these pains, with attacks of fever similar to those of tertian. Under these complaints he lost flesh and strength, and at length, under low and restrained diet, they underwent some abatement, which appears to have continued for some years.

In his 66th year he was attacked with sciatica and other rheumatic complaints, and under the influence of much affliction, caused by the bad health of his wife and son, he had a slight attack of somnolence and hemiplegia of the left side. Ten days after this attack he was awakened during the night with an acute violent sense of excruciating pain at the lower end of the sternum, which produced great agitation, and difficult breathing, and obliged him to scream violently. This pain, which was more acute at its commencement than afterwards, soon spread from the sternum to the whole chest, and the breathlessness and sense of tightness in the chest was so much aggravated, that he was unable to observe the horizontal position, but was obliged to breathe in the sitting position with his chest inclined forwards, agitating his arms and hands in every direction, and in apprehension of immediate dissolution. The pulse was not gone or feeble, but frequent, vibratory and strong; the face was not pale; no part of the body was cold; and all the external signs of this attack indicated rather an internal struggle of the blood than either fainting or syncope.

In the first three days the patient had three attacks of this description, the second and third being the longest, but neither of them above half-an hour. Blood was drawn from the foot with relief. On the fifth day another attack, with the same pain and constriction in the chest, came on with such violence that immediate blood-letting was deemed necessary, and was performed to the extent of ten ounces. After this, which was on Thursday, he had an attack of acute pain. On Friday he suffered from pain at the stomach, and spent a sleepless night.

In the latter part of Sunday the pain in the breast came on anew, the breathing became difficult with agitation of the person and jactitation of the arms; the patient became speechless; the eyes were shut; stupor came on; the pulse stopped, and death was complete, not more than one-quarter of an hour elapsed from the beginning to the end of the paroxysm.

Inspection of the body next day disclosed the following phenomena.

The right *pleura* was adherent to the *pleura costalis* by old adhesion; and the posterior part of the lung seemed reddened, (probably by the congestion of gravitation). The left *pleura* was natural. The left lung was redder, like the right at its posterior region. No serum or blood was found within the *pleura*.

The pericardium was tumid and distended with liquid, so much that it occupied the third part of the cavity of the chest; and as soon as it was cut open a large quantity of bloody serum escaped. When the serum was entirely removed, about two pounds of **coagulated blood** were found in the bottom of the pericardial cavity. This being removed, the pericardial surface of the heart was carefully examined, especially at the base to see, if any vestige of fissure or orifice could be detected. All was found entire and unchanged, and nothing was observed in the substance of the heart except a slight protuberance situate on the lateral wall of the left ventricle, where its external surface, for the space of three inches longitudinally and two inches transversely, appeared bluish and a little elevated; and some small branches of blood-vessels were prominent and projecting, and in some degree varicose. Although this appeared on its external surface at first quite entire and impervious, yet on inspecting it carefully, and trying it with the probe, it appeared broke and lacerated, with a fissure scarcely larger than **two Paris lines**, within which the probe introduced, went freely into the cavity of the ventricle. Through this aperture the blood had escaped from the ventricle into the pericardium.

No description is given of the nature of the projecting portion of the ventricle or of the parts of which it was composed. But it is scarcely possible to doubt that the tumour had been formed by the substance of the left ventricle giving way, and that it had become so thin as at length to burst.

The state of the abdominal organs it is unnecessary to mention.

2. The next good instance of this lesion is recorded by J. G. Walter, in a memoir contained in those of the Royal Academy of Sciences and Literature of Berlin, and which occurred in a heart received from Buttner, Professor of Anatomy at Königsberg. The case is to the following effect.

A merchant, aged about 50, complained for several years of palpitations and feelings of anxiety; and after long suffering expired.

Upon examining the heart, it was found that the left ventricle was very thin, and composed of relaxed muscular fibres; the apex was elongated and formed a large sac.

Walter expresses the opinion, that, in consequence of the conformation of this heart, the left ventricle was unable to impel into the aorta the necessary quantity of blood, and that, at each contraction, there remained always in the ventricle a quantity of that liquid, which, accumulating and distending the ventricle, at length gave the apex of the heart the shape of a sac.*

3. Morgagni mentions in his twenty-first letter, Art. IV. the case of an old man of 64, who frequented taverns, and had in the latter years of his life become subject to inflammatory disorders of

* Nouveaux Memoires de l'Academie R. des Sciences, &c. année 1785 Berlin, 1787, p. 57.

the lung. For these he went into the hospital of Padua, without presenting any symptoms of disease of the heart. He died, and upon inspection of the body there was found, at the posterior half of the left ventricle, two fingers'-breadth above the apex of the heart, a tubercle of the size and shape of a cherry, the one-half of which was sunk in the substance of the heart, and the other half projected from its surface. This tumour resembled, he says, the hydatids observed at the surface of the other internal organs. It is manifest, nevertheless, that it could not have been a hydatid; and was more probably an aneurismal tumour.

4. Mr Thurnam, in his memoir on this subject, has shown that the lesion was known to Mr John Hunter, who observed it in dissecting the body of General Herbert, who had expired suddenly in April 1757, while sitting on his chair. This gentleman was of a full habit, and had suffered from bad health two years before death, but had been relieved by blood-letting. He was wont to complain of heaviness at the heart, and had been dropsical, but the dropsical symptoms had subsided before death. The pulse was tolerably regular.

The blood-vessels of the head were found very turgid with blood, and nearly a quart escaped during examination. The lateral ventricles were very large, and filled with serous fluid. The apex of the heart was adherent to the pericardium. Upon cutting into the left ventricle, it was found white and callous, and had lost, it is said, its contractile power. At the apex it was very thin, and had formed a kind of aneurism, which was lined by a thrombus of its own shape.

This is not a very well marked case, and the parts not being preserved, no opportunity is afforded of ascertaining to what extent it really approaches the class of cases known as aneurism of the heart.

5. 6. It appears, however, that the museum of the Royal College contains at least two other specimens, if not three, of the same lesion. In one of these the change is described as an appearance similar to tumour of the inside of the right ventricle, composed of a succession of laminæ of coagulated lymph, that seemed to be dissolved in the centre into a kind of glairy mucus, which gives it a cavity. The other, No. 361, is a portion of the apex of a heart showing a similar formation in both ventricles.

The truth is, that it is not uncommon to find the apex of the left ventricle attenuated and distended beyond the level of the rest of the chamber, and small clots of blood contained in the imperfect recess thus formed.

7. The same lesion was noticed by Dr Baillie in the following terms.

"It sometimes happens, though, I believe, very rarely, that the heart becomes aneurismal. This disease consists in a part of the heart being dilated into a pouch, which is commonly more or

less filled with coagulated blood. Of this disease I have seen only one instance. The apex of the left ventricle was dilated into a pouch large enough to contain a small orange; was much thinner than in the healthy structure, and was lined with a thick white opaque membrane. There was hardly any coagulated blood contained in it; but the quantity of the coagulated blood in an aneurism depends commonly on the size of the bag."

"This disease," further adds Dr Baillie, "most probably arose from the muscular structure at the apex of the ventricle having become weaker than in any other part, so that when the ventricle contracted upon the blood, it was pushed against the weakened part, which was not fully able to resist its impetus, and therefore was gradually dilated. Had the strength of the apex of the left ventricle been in due proportion to that of the other parts, it would seem impossible that the aneurismal swelling should ever have taken place."

In a previous part of the same chapter, the following observation is found: "In some instances a coagulum of blood has been found, of a laminated texture, in such parts of the heart as are more remote from the direct current of the circulation. This laminated texture shows that the coagulation had taken place during life, and in a gradual manner."

"Two cases of this kind have been observed by Mr Brodie, (now Sir Benjamin) who is well known as an excellent anatomist and physiologist. Such cases of coagulation are much less complete than those which have been generally called polypi, and which fill up entirely one or more of the large cavities of the heart." —Baillie's *Morbid Anatomy*, Chap. II.

It is impossible to doubt that coagula of the laminated texture now described must have been formed in small aneurismal recesses.

The next case which I give is contained in the classical treatise of Corvisart, who introduces it with the observation, that "it proves that the heart may, besides the dilatation peculiar to it, become the seat of aneurismal tumours, quite similar to those by which the arteries of the extremities are sometimes affected.

8. A negro, 27 years of age, was received into the *Hopital de la Charité* on the 17th of October 1796. On the day of admission, the patient was in a state of unutterable anguish and anxiety; and the history of the disease could not be collected. The breathing was constrained and interrupted; he felt little pain in the chest, which further emitted a good sound all over; he complained that he felt violent pain towards the region of the stomach, and that of the liver; the pulse was small, contracted, weak, and frequent. Next day he had a hemorrhage from the nostrils, so profuse, that it accelerated the approach of death, which took place the same day.

Inspection of the body showed that the heart retained its natural size. But the upper and lateral part of the left ventricle was covered by a tumour, almost as large as the heart itself, and

the base of which was confounded with the parietes of the organ. Before reaching the centre of this tumour, by cutting from without towards the centre, it was necessary to divide a layer of substance like cartilage, a little thicker than the walls of the ventricle. The substance which formed this tumour had, indeed, the consistence of cartilage, but it retained the appearance and colour of muscular texture. The inside of this tumour contained several layers of clots, pretty thick, quite similar to those which fill a part of the cavity of aneurism, occurring on the extremities, with this difference only, that the colour of these layers was more pale. This same cavity communicated with the interior of the ventricle, by a small opening, the margin of which was smooth and polished. It was evident, he adds, that this tumour had been formed between the fleshy substance of the heart, and the cardiac pericardium, which was intimately adherent to the surface of the sac.

The mitral valves were thickened and ossified.

The stomach and bowels contained a good deal of blood, almost pure and coagulated, the result of hemorrhagy.

Upon this lesion Corvisart makes the following observations:

“How are we to explain the formation of a tumour like that now described? Can it be ascribed to an incomplete rupture of the interior muscular walls of the heart? In this supposition, could an internal layer of the muscular substance of the heart be lacerated by any cause? While the external layers remained entire, could the former have undergone dilatation, and formed an aneurismal tumour?”*

9. The next example of this lesion which I shall notice is published by Zannini, the translator of the Italian edition of Baillie's *Morbid Anatomy*, in his notes to that work, and is to the following effect.

A gondolier, of middle stature, well-made, when at the age of 19 years, fell, and struck his chest on his gondola. The pain which he felt was transitory and void of manifest danger. When at the age of 25, he was attacked with pain in the side, difficult breathing, cough, sputa of an unfavourable character,—symptoms which were assuaged by blood-letting, demulcents, and the use of the neutral salts. When cured of this disorder, he felt, for the first time in the right side of the chest, a sense of beating, with the feeling as of a body moving from above downwards, and across within the chest, and shooting to the region of the stomach, and even below that. At this time he worked and eat like a person in health, and drank a great quantity of wine; the pain he felt only during great atmospheric changes. Two years after he was attacked with the same infirmity, during which the pain, which was originally felt in the right side of the chest, proceeded more directly towards the heart, and from that time it was always found in the same place, and was obstinate, though under the

* Sur les Maladies du Cœur, 3ième edition, Paris, 1818, p. 282.

same remedies, the other symptoms attending the disorder disappeared in a short time. They returned, however, whenever the patient worked to any excess. Always incommoded, he complained of pains in the heart, and of a more violent beating in the region of the stomach than elsewhere. Twice the pain, the fever, and the sense of suffocation attacked him so violently, that he was nearly dead. He continued to work, nevertheless, at the few intervals of ease which the severity of his disorder allowed; for need and affection for his family obliged him. The fever and cough which resulted from labour were allayed by the use of opium. In this state he lived for two years, during which he could sleep only on the back. He had now attained his 29th year, when, one day having eaten, and drank more than usual, and feeling himself very strong, he ardently sprung on board his gondola; but scarcely had he begun to row, when he fainted, fell into the water, and expired.

The body presented a moderate degree of plumpness. The lungs were sound in all parts; and no fluid was found within the pleura.

The pericardium contained some ounces of yellow serous fluid. The membrane was thicker than natural, and towards the base of the heart it was more than one line thick. At this part its inner surface adhered to the lowest part of a tumour as large as the fist of an adult, which projected from the left and lower part of the left ventricle of the heart. The adhesion of the pericardium, which appeared to be only at the apex of the tumour, diminished gradually towards its root, where the pericardium was free from all adhesion; and the rest of its inner surface presented numerous vascular ramifications, which, in different directions, proceeded to the tumour. The outside or pericardial surface of the heart, excepting the parts forming the base of the tumour, presented nothing remarkable. The sound portion of the heart was covered with much fat.

The heart was opened by an incision extending from the right auricle towards the apex of the organ, as far as the lowest extremity of the tumour, dividing the septum also in the middle. In this manner the shape of the parts and their healthy and diseased states were easily distinguished.

The septum was sound, but harder and thicker than usual. At its lower end was found the origin of the aneurismal tumour, and here the disorganized walls of the heart formed the origin of the tumour; while near the apex of the heart began the change in the fleshy texture of the left ventricle.

The orifice of the tumour, viewed from the left ventricle, showed a border, firm, elevated, and projecting into this cavity. This orifice led into a sac or pouch about one inch and a-half in diameter, which contained blood simply coagulated, but which further adhered to the surrounding walls with greater tenacity than

a simple material or inorganic adhesion. This clot had the Modena colour of venous blood.

The walls of the tumour varied in thickness from three-quarters of an inch to one inch and a-half. The thickness was greatest next the septum or towards the apex of the heart. The walls of the tumour consisted of a hard lardaceous substance, much more resisting than any sort of flesh, but less consistent than cartilage. In this substance were disseminated masses of a matter which, though neither saponaceous nor plaster-like, partook of the physical qualities of plaster and of soap. It was quite inorganic.

The walls of the left ventricle, fleshy, firm, and resisting, presented all the muscular pillars of its cavity in the same state. The fleshy texture of the right ventricle and that of the right auricle partook also of this state. All the other parts of the heart were healthy.

The valves of the aorta were entire and well developed. The walls of the artery were a little thickened, and its inner surface was covered with some milk-coloured spots proceeding to ulceration.

The only approach to the kind of lesion now mentioned, noticed by Bertin, is contained in the following words. "We have often met with one of the cavities of the heart dilated in one point of its extent, while it elsewhere preserved its natural state, or was even contracted. It is not uncommon, for instance, to observe the portion of the right ventricle nearest to the pulmonary artery in a state of considerable dilatation, the rest of the ventricle preserving its ordinary calibre."

From this it may be inferred that Bertin had seen no example of the lesion, and, indeed, it seems doubtful whether he had formed a clear conception of the anatomical and physical characters of the aneurism of the heart. It is very common to find in various diseases of the lungs, especially chronic bronchitis and emphysema, the right ventricle at its base near the origin of the pulmonary artery, affected either with dilatation or hypertrophy, or both united; but this dilatation bears no resemblance to the disruption of parts and texture presented in aneurism.

M. Rostan mentions, in his work on Clinical Medicine, a case of partial aneurism of the walls of the heart, in which the aneurismal sac was more or less voluminous, and contained concrete fibrine added to the walls of the heart.*

In 1826, M. Berard, in a thesis or dissertation published at Paris before the Faculty, recorded two examples of this lesion.

10. The first case occurred in the person of a female of 50 years, of moderate corpulence, and without serous infiltration into the lower extremities. The lungs were united by means of a dense laminated tissue to almost all points of the costal pleuræ.

* Cours de Medecine Clinique, Tome ii. p. 682. Paris, 1826.

The pericardium, largely distended by the heart, upon which it did not glide, was elevated towards the notch of the anterior margin of the left lung, by a spherical tumour which altered the shape of this sac. On continuing the dissection, it was observed that the pericardium adhered everywhere to the heart and to the large vessels, so that the serous cavity had been entirely obliterated. The medium of adhesion was fine cellular tissue traversed by an infinite number of vessels injected with blood. The heart, divested of its capsular covering, was covered in divers points, especially in the vicinity of the tumour, and on the right auricle, with membranous patches newly formed, and as if the result of recent inflammation. The tumour which distended the pericardium was placed at the apex of the heart. Its bulk was equal to that of a middle-sized apple; its surface was rounded and reddish in colour. A circular depression distinguished it externally from the apex of the two ventricles, and furnished it with a sort of neck. This was the external appearance of the heart.

The chamber of the right ventricle was sufficiently large; its apex extended only to the neck already mentioned, without communicating with the aneurismal sac; its walls were a little attenuated and flaccid. The chamber of the left ventricle was much larger than that of the right; its apex communicated freely by a round orifice one inch and a-half in diameter, with the cavity of the tumour. The walls of this ventricle were of the average thickness on the side of the septum; towards the left margin, on the other hand, the muscular substance was progressively attenuated, continuing itself over the walls of the aneurismal sac. The lower half of this ventricle was smooth, and presented no fleshy column. The aneurism was lined internally with consistent grayish clots, of old organization, arranged in thin concentric plates. The most external, which were quite dried and firm, adhered closely to the inside of the sac. Those most internal seemed to be continued by their circumference with the internal membrane of the ventricle. It was not easy to determine the nature of the walls of the aneurismal sac. Externally, and on the left, was seen the fleshy substance of the ventricle in continuity with this sac; but along side the septum the muscular tissue seemed all at once to be stopped, while its place was supplied by a very thin transparent plate, strengthened within by fibrinous patches covering it,—without by the pericardium, the attachment of which at this point was greatly more manifest than elsewhere.

M. Berard asks here, was this plate the serous membrane of the heart a little thickened? With the latter it appeared to be continuous; but it could scarcely be affirmed that the membranes were identical.

11. The second case recorded by M. Berard was collected by

M. Berard Junior, then resident pupil at the Hôpital de la Pitié. The case occurred in the body of a man, aged 55, who had been under the care of M. Bally, physician to the hospital, and who had laboured under several of the symptoms peculiar to diseases of the heart.

The body was loaded with fat; the face was bloated and violet-coloured; and the abdominal muscles were swelled by the serum effused into the subcutaneous cellular tissue.

Upon opening the chest the pericardium presented an extraordinary shape, being swelled and rounded at the level of the apex of the heart. When the pericardium and heart were laid open, they presented nearly the same appearances as in the previous case. The following differences were recognized. 1. The heart was of very great size, so that hypertrophy with dilatation of the two ventricles was complicated with partial dilatation of the apex of the left ventricle. In the first case there was only simple dilatation of the left ventricle, complicating partial dilatation of the apex. The pericardium adhered only at the level of the tumour; the contiguity of the two serous membranes was preserved in all other points. In the first case the adhesion was general, and all cavity had disappeared. 2. The clots which filled the sac were whitish and well organized; but they were still humid, mingled in some points with blackish concretions of blood; the whole of this deposit, indeed, appeared of no very long standing. The fibrinous concretions in the first case were dry, grayish, arranged in concentric layers, and of a much older formation.

12. M. N., a gentleman, aged 77, of excellent constitution and considerable muscular strength, requested the assistance of M. Cruveilhier in November 1817,* for a fit of suffocation or asthma, which had come on in the bath. His symptoms were violet colour of the face, cold sweat, extreme oppression, anguish; expectoration at first impracticable, then bloody and frothy; the pulse hard, full, frequent, and very irregular. M. Cruveilhier learned that the patient had never before been affected with similar symptoms, but that in the year 1809, he had complained of a sense of suffocation and habitual constraint in the region of the heart; that he had requested the assistance of the ablest practitioners in Paris, who had regarded the disorder as spasmodic, or spasms of the heart, and who founded this opinion upon the influence which the most trifling mental emotions exerted on the disorder. M. Cruveilhier had attended M. N. for the first time in 1816, that is one year according to one account, three years according to another, previous to the violent asthmatic fit, for symptoms of *pleuro-pneumonia*, which yielded to one general blood-letting, followed by several local bleedings, and the application of a blister to the side. During this attack the pulse was very full and hard.

* M. Cruveilhier says 1817. M. Breschet, who also gives the case, says 1819.

On the present occasion, as leeches had been applied to the anus the previous evening, all that was deemed necessary was to place the patient in the best position before an open window, to employ *pediluvia* strongly sinapised, stimulating frictions over the extremities, and to give every quarter of an hour one spoonful of a mixture, consisting of a drachm of gum-ammoniac, dissolved in one ounce of oxymel of squill, one ounce of balm water, one ounce of orange-flower water, and three ounces of pennyroyal water. By the use of these measures the sense of suffocation rapidly abated, and the fit went off. At the end of some hours M. N. was in his usual state.

From this time, however, M. N. was no longer the same person. Endowed hitherto with great strength of mind, he became feeble and pusillanimous. Every moment he believed his life threatened by a mortal disease; this became his ruling idea.

The days passed tolerably well; and, amidst his children and friends, he seemed less to apprehend the approach of death. The nights were the periods of dismay. No sooner did he enter his bed-chamber than the remembrance of his past fit, and the apprehension of a future one, produced, as it were, an electrical shock at the bend of the arms and the hams, and, at the same time, a sense of constriction at the region of the heart. The latter sense of constraint at the heart was now permanent; and the patient himself attempted to communicate an idea of its nature, by saying that his heart felt like a purse of which the opening was closed. This sense of constriction was further unconnected with the organs of respiration; for, on the one hand, the patient could amply dilate his chest, and, on the other, the lungs repeatedly examined, gave indications of being in a state of complete integrity. When the patient was seated like a patriarch amidst his numerous family, by whom he was almost worshipped, he appeared to enjoy the best possible health; but the slightest motion gave rise to a sensation of precordial distress, and with that a feeling of the most dreadful alarm. The pulse was hard, very full, and sometimes intermittent; the capillary system of the face was easily injected. M. Cruveilhier did not note the state of the heart; methodic auscultation and percussion were not yet practised as means of exploring the state of that organ. The appetite was excellent. The name of asthma applied to his disorder inspired his mind with some confidence, from the idea of longevity which is attached, in the language of the world, to this disease. M. Cruveilhier believed it indeed asthma, symptomatic of an organic disease of the heart with hypertrophy. But what was that disease, he asks? He found no symptom of remarkable dilatation, or of contraction of the apertures. M. C. thought it might be disease of the heart, which might suddenly terminate life by a fit of suffocation or an attack of apoplexy, or more slowly by symptomatic dropsy.

From this time M. N. was subject to slight fits of asthma, which took place most commonly in the morning, and were distinguished by oppression, hardness and irregularity of pulse, wheezing respiration, and terminated on expectoration of reddish frothy mucus. Fresh air, the sitting posture, support to the legs, and sinapised pediluvia were always sufficient to restore the equilibrium. There was constantly slight œdema of the legs behind the ankles.

At length, after some days of catarrh, with the habitual expectoration, M. N. was attacked, on the 12th July 1817, with a slight fit of asthma. On the 15th, at half-past seven in the morning, M. Cruveilhier was hastily summoned, and found with the patient a professional brother, who had been exerting himself for one hour for the relief of the patient. M. N. had dined the previous evening as usual, had slept well, and had wakened bathed in perspiration, which he was anxious to maintain, notwithstanding the oppression, but was obliged speedily to rise and seat himself on a sofa. The face was livid, the lips blackish, the person covered with a cold sweat; the nose cold; the pulse stiff, hard, frequent, but regular; the respiration wheezing; and beside him was a napkin covered with thick sputa, which he had expectorated during the night, and a reddish froth discharged since the accession of the fit of asthma. All at once the head dropped forward, and the pulse and breathing became at first slow, and then at once stopped, notwithstanding all the means which were employed with the hope of arresting the progress of the asphyxia.

Inspection of the body disclosed the following facts.

The frame was athletic; the chest perfectly well formed; the substance of the costal cartilages sprinkled with grayish osseous points.

The two lungs were adherent; the left by cellular bands, easily destroyed; the right by very firm fibrous bands, in the midst of which was seen a fibro-cartilaginous plate from five to six inches long, by one broad, and six lines thick. This plate remained attached to the costal pleura.

The lungs were sound, crepitating, but infiltrated with a considerable quantity of frothy serum, which flowed abundantly from incisions made through them. Two glasses of limpid serum were contained in the left thoracic cavity. The last bronchial divisions were very much injected.

The pericardium adhered to the heart near its left margin, by means of loose cellular filaments. The adhesions being destroyed and the heart raised, there came into view a round firm tumour, of the size of a nut, which arose immediately behind the left margin of the heart, at the junction of the upper third with the two lower thirds of this margin. At the level of this tumour, and all round, were the adhesions.

The left ventricle, which was hypertrophied, being opened, it was found that the tumour was composed of a cyst with very thick walls, which communicated with the ventricular chamber by an opening capable of admitting easily the index-finger; that this orifice, which was bounded as it contracted by a prominent fibrous ring, was situate between two fleshy columns, the right of which formed one of the large *columnæ carneæ* of the heart, while the left was a small *columna*; that the sac or pouch was cartilaginous and osseous, resisting a strong degree of pressure; and that it was lined by concrete fibrine.

The mitral valves presented at their attached margin stony concretions, and a pulpy matter resembling partly milk of lime, partly concrete purulent matter. The aorta was covered with phosphatic concretions, some of which very irregular, were in immediate contact with the blood. Under some of these patches was seen a substance like blackish purulent matter, separated from the blood by a thin pellicle, which was in some points lacerated.

The spleen was very large, and was covered by a fibrous crest, which was removed like the pellicle of an almond.

The gall-bladder was filled with eighty-one biliary concretions varying in size.

This case, which is taken from the large work of Cruveilhier on Pathological Anatomy, was published also in the *Bulletins de la Société Anatomique*, and in Repertoire of M. Breschet. There are some discrepancies in the dates of these several accounts. M. Breschet states that the first fit of violent suffocative asthma took place in November 1819, and that the fatal illness occurred in July 1820. M. Cruveilhier in his own account represents the first fit of violent asthma to have taken place in the end of 1817, and, with some inconsistency, the fatal illness to have ensued in July 1817. It is clear that there is some error, clerical or typographical; but this I cannot venture to correct further than to say, that the fatal illness must have ensued in the course of the year after the occurrence of the fit of violent asthmatic suffocation.

13. M. Dance admitted, on the 27th March, into the clinical ward, an old soldier named Ferre, aged 49 years, of a good constitution, with a large chest, and who had been labouring, for from six to eight months, under symptoms of stifled, oppressed breathing, chiefly when he took a little exercise. The legs were much swelled, the body distended by a large quantity of liquid; the face bloated, bore the impression of the serous cachexia; he kept himself often seated in bed, and was obliged to rise during the night, in order to breathe more easily. Examined by auscultation, the left ventricle of the heart gave a very strong impulse, and made be heard at each contraction a well-marked bellows sound; afterwards this sound diminished and disappeared; the

pulse, sometimes irregular, was small in proportion to the beats of the heart.

The treatment first employed consisted in diuretics and occasional cathartics.

On the 17th of May, about seven weeks after admission, the dropsical symptoms had manifestly gained ground, and the sense of stifling in the breathing was more urgent.

In the night between the 18th and 19th May, the patient suddenly lost consciousness, and was affected with hemiplegia of the whole right side. Speech was gone, the face was distorted to the left, the pupils were contracted, but equal in diameter; the members of the left side were agitated; respiration was plaintive; the pulse hard and strong; and the two jugular veins much swelled. Blood-letting was performed with some relief.

On the 20th, the patient had more consciousness, and more command over the motions of the right side. Next day he was more stupid; and palsy of the right side returned. The breathing became embarrassed and rattling; and death took place on the morning of the 23d May.

The body, inspected on the 24th, presented the following appearances.

Externally serous infiltration of the limbs, and slight cadaveric rigidity.

The membranes of the brain were traversed by numerous vessels loaded with blood; the *pia mater* was infiltrated and elevated by transparent serum. The brain was a little soft and much dotted by red points; the ventricles contained much serous fluid, but without being dilated. The left *corpus striatum* larger than the right, of a livid colour in its substance and surface, was so much softened, that, under a stream of water, it was entirely dissolved and swept away. The whitish plates of the *corpus striatum* then showed their foliated arrangement in the gray matter much more distinctly than could have been effected by the most minute dissection. This softening was confined to the *corpus striatum*. The rest of the brain was sound. The cerebellum and annular protuberance were unchanged.

The lungs were emphysematous anteriorly, and were gorged with blood behind.

The heart presented several remarkable peculiarities. 1. Its size was nearly double that of the normal state. 2. Towards the point corresponding to the apex of the left ventricle, it presented a rounded swelling of the size of an ordinary nut; and here it was closely attached to the pericardium. 3. The right ventricle appeared to be a mere appendix to the left ventricle; its walls were of the ordinary thickness; the portion corresponding to the entrance of the pulmonary artery was remarkably dilated, while the lower part retained its normal capacity. 4. The tricuspid valve

was yellowish, and in a state approaching to ossification. 5. The sigmoid valves of the pulmonary artery were healthy. 6. The left ventricle was almost alone the cause of the great size of the heart; it was rather dilated than thickened; the hypertrophy of its walls was evident only at the base; its capacity was considerable; but it contained very little blood. 7. Towards the apex of this ventricle an opening, capable of admitting the index-finger, led into a more spacious cavity, superadded to the apex of the heart, the walls of which were formed chiefly by the pericardium, which adhered closely, while its cavity contained some layers of very dense and very adherent fibrine. The place where the sac was detached from the apex of the heart was marked by a slight contraction, and by the disappearance of the muscular fibres of the heart; but, nevertheless, some attenuated whitish *columnæ* were prolonged into the cavity of this dilated portion. The attachment of this sac or pouch to the pericardium was so close that there was no appearance of approaching rupture. 8. The greatest part of the *columnæ carneæ* of the left ventricle were decolorized and converted into a sort of white resisting fibrous tissue. 9. The mitral valve contained towards its margin free and attached fragments of osteo-petrous matter; it had lost, in a great degree, its mobility, but still allowed a free communication between the auricle and ventricle. 10. The aortic valves were in the natural state. 11. The two auricles did not partake in the dilatation of the other cavities of the heart. 12. The aorta presented numerous points of bony and cartilaginous degeneration.

The liver was granular, yellow, hard, and loaded with blood. The alimentary mucous membrane was in like manner loaded with blood. The cavity of the peritoneum was distended by much serous fluid.

The case which comes next in order is one which occurred in the body of a person of great celebrity and exalted histrionic talent.

14. Talma, the celebrated tragic performer, had enjoyed in youth perfect health, uninterrupted by any serious disorder. He observed merely that the functions of the bowels were not performed regularly. To these habitual inconveniences his attention was directed principally at the time when a young and able competitor appeared on the stage. Afraid of losing the public favour, he doubled his attention and study; but he quickly observed that his zeal was not supported by his strength. His voice, which was strong and sonorous, almost invariably lost its power after the first scenes. He had, without avail, consulted several celebrated physicians, and, discouraged by the inefficacy of their attentions, he seemed determined to abandon the theatre, when he discovered himself the cause of the change in his voice.

He was about to perform the part of Orestes in *Andromache*, in which he had some years before laid the foundation of his high character, but to which he looked forward with a feeling of dread, since the weakness of his physical powers no longer enabled him to express energetically the fearful passions which he had to represent. From the morning of the day on which he had undertaken to perform this character, he experienced a sort of uneasiness, dull colic pains, and a sensation of fulness and load in the abdomen. To deliver himself from these he had recourse to several emollient enemata ; a remedy which he had hitherto employed but rarely. He felt relief so remarkable after the evacuation thus procured, that in the evening, to his great surprise, recovering his strength in all its power, he was able to support to the end this part, the most painful and fatiguing of his employment. From that time, owing to the same precautions, he recovered his full superiority, and proceeded, without rival, in the career in which every step was marked by new success.

The health of Talma was, however, not fully restored. The functions of the bowels were always performed with difficulty, and irregularly. At one time, he was tormented by obstinate constipation ; at another, scanty and imperfectly formed evacuations took place. In 1802, he consulted Corvisart ; but derived from his advice only transitory relief.

In 1809, he was attacked with vomiting, abdominal pain, and other symptoms of disorder of the bowels ; but after some weeks recovered, chiefly under the use of proper regimen. He continued, however, still to suffer under imperfect action of the intestinal tube for many years afterwards.

In September 1825, when he was at least 62 years of age, these complaints became still more urgent and constant. The winter was spent in considerable suffering and distress ; and in May 1826, when he was tormented by most urgent tenesmus, which obliged him to go to stool ten times daily without avail, he was much reduced in flesh and strength. The disorder proceeded steadily and uncontrolled by all the remedial means which could be suggested by the conjoined or successive endeavours of twelve physicians and surgeons, the most eminent then in Paris,* during the months of June, July, August, September, and nearly two-thirds of October ; reducing the patient to the last stage of debility, and terminating fatally on the 19th of October at half-past eleven in the morning.

The body was inspected next day at one o'clock by M. Breschet in presence of all the physicians and surgeons who had previously been consulted.

* M. Biett, M. Marc, M. Breschet, M. Lebreton, M. Husson, M. Dupuytren, M. Broussais, M. Fouquier, M. Bourdois, M. Chaussier, M. Ferrus, M. Begin, M. Amadée Talma, the latter a relative.

The body was very much emaciated ; the limbs and penis were œdematous ; the belly was very much enlarged, and presented in all points an elastic resistance and a well-marked green colour.

It is unnecessary here to give all the details regarding the state of the abdominal viscera, which do not belong to the present subject. It is sufficient to say, that, six inches above the anus, the rectum had become the seat of an annular or cylindrical contraction about two inches long, so that its internal diameter was not more than three lines ; that immediately above this contraction the bowel was dilated, and in the centre of this dilatation, and on the anterior surface of the intestine, was an irregularly rounded ulcerated opening about one inch in diameter, through which had escaped a quantity of bistre-green coloured matter found in the pelvis ; and that the contraction, which amounted to obliteration at one part, one inch and a half long, was caused by the bowel being converted into a cellulo-fibrous substance, for this space without any trace of cavity. Talma, in short, had died from stricture of the rectum, terminating in perforation above the stricture, and in peritoneal inflammation.

The heart adhered to the pericardium towards its apex. Here it presented a blackish spheroidal tumour arising from the substance of the left ventricle, as large as a small egg, and which had displaced the apex of the left ventricle, and thrust it a little forward. This tumour was separated from the apex of the heart by a small circular depression.

The right chambers of the heart and their appendages were healthy. The left auricle, the auriculo-ventricular orifice, the mitral valves, and the aorta were natural. The left ventricle only was dilated without its walls having been either attenuated or thickened. The chamber of the ventricle was sufficiently capacious to hold a pullet's egg of the ordinary size.

At its lower extremity the ventricle communicated by an aperture of about one inch in diameter, with a rounded sac or pouch, the breadth of which exceeded that of its orifice, and which could contain a small egg. The communication between the ventricle and the aneurismal sac was effected by a cartilaginous ring, two lines and a-half thick ; at quitting the middle of its wall the ring was progressively attenuated, and terminated by degenerating into a membrane, which, uniting with the folds of the pericardium, constituted the aneurismal sac. By its upper margin, the ring was united to the fleshy fibres of the heart, of which it appeared to be the continuation ; and by two opposite points of its diameter, it gave attachment to the *columnæ carneæ* of the mitral valve.

By means of this pathological change, the cavity of the heart, which in the sound state forms a cone, the apex of which is towards the apex of the heart, and the base is towards the auriculo-ventricular orifice, had taken the shape of a hollow

cylinder, opening below into the larger cavity of the aneurismal sac.

This aneurismal sac was formed by the two folds of the pericardium, which could be easily traced upon the origin of the fibro-cartilaginous ring. These folds, which were confounded, became afterwards insensibly thinner as they receded from the ventricle. The membrane forming the bottom of the sac was not thicker than the *dura mater* under the parietal bones, and resembled it in texture and density. Above, near the depression between the apex of the left ventricle and the apex of the aneurismal tumour, was seen the separation of the two folds of the pericardium, and under the cardiac fold of the covering were perceived some very thin fasciculi, diminished progressively, and disappearing in the tumour. These fasciculi appeared to belong to the superficial fibres of the fleshy structure of the heart. Below they were not visible, and the walls of the sac were formed, as already stated, by the united and adherent folds of the pericardium.

The smooth polished aspect of the inner surface of this sac might have led to the belief that it was lined by the inner membrane of the heart, continued into it. Nevertheless, beyond the cartilaginous ring, and over the whole circumference of the opening of communication between the cavity of the ventricle and that of the tumour were distinguished vestiges of a very thin fringed denticulated membrane adhering to the clots contained within the tumour. These fringes appeared to result from the laceration of the inner membrane of the heart.

The aneurismal tumour contained a pale red-coloured substance, similar in tint to decolorized muscles, arranged in concentric layers, and which filled almost the whole sac. These layers could be divided into thinner lamellæ, not thicker than leaves of paper. They withstood strong traction, and appeared in this respect firmer and more tenacious than clots of blood. In the centre was a matter less firm, more coloured, and more approaching to the nature of blood.

It was allowed by all who saw this tumour, that it was an example of the consecutive aneurism of the heart.

An important question was, how or when did it originate, and did it indicate its presence by any symptoms? In answer to the first question, it was then learned from the relatives by M. Bielt, that, two or three years before, in consequence of the violent efforts which Talma made in performing the laborious part of Hamlet, he felt all at once an acute sense of heat in the region of the heart, and a degree of uneasiness which continued for two or three days, but to which he gave no serious attention. With regard to the second, it is manifest that, if Talma was not obliged to give attention to these feelings, they could scarcely be said to indicate with certainty the presence of any formidable or serious lesion.

It is merely said, further, that after this accident he complained at intervals of palpitations, which took place particularly when he was about to appear on the stage.

15. In the museum of the Faculty of Medicine at Paris is preserved a preparation of a morbid heart, of which M. Breschet gives a description to the following effect.

The heart is large, but its shape appears to be natural. An incision made on the right side of its anterior surface shows that the right or anterior ventricle is large and its walls are thin; the *columnae carnae* and the valves are sound; the whole surface of the heart beneath the serous membrane is covered with yellowish fat.

From the anterior surface and left side of the left or aortic ventricle arises a tumour of the size of a large orange, separated all round from the ventricle from which it springs, by a deep furrow, and connected to the heart by a short footstalk. This tumour, slit on its external and anterior side, shows at one part a cavity filled with clots of blood,—lamellated, dense, and resisting, and in the centre of the sac, an opening from five to six lines in diameter, by which it communicates with the left ventricle. The outline of this canal of communication is irregular, wrinkled and fringed.

The walls of the aneurismal sac are in several points about ten lines thick, and are formed, 1st, by the pericardium being thickened; 2d, by a resisting fibrous tissue mixed with cartilaginous plates; 3d and lastly, by pseudo-membranous plates, produced by bloody clots. The fibrous membrane of the pericardium covered the whole extent of this cyst, and had formed with it at various points of its surface strong firm adhesions. The whole external surface of the heart, and especially that of the tumour, presents numerous vascular ramifications, and in some points a wrinkled and whitish flocculent aspect, which show that these textures had been the seat of chronic inflammation.

The capacity of the left ventricle is large; the walls about one inch thick; the valves sound, excepting at their upper surface, which is of a rose tint, which extends into the auricle and aorta.

The auricles and the vessels at the base of the heart present nothing remarkable.

16. The following case is given by M. Cruveilhier in the 21st number of his work on Pathology and Anatomy. (Case collected by M. Padiou under M. Prus.)

D'Etang, aged 83, an old soldier, who had been in Bictre for several years, entered the Infirmary on the 6th September 1834, complaining of extreme weakness, especially in the lower extremities. He had also chronic pulmonary catarrh. The pulse was small and frequent, with occasional intermissions. The beatings of the heart were feeble and obscure. The region of the heart was sonorous. Nothing remarkable was observed till the

23d September, when the breathing was more constrained and the pulse was quicker, while the crepitating rattle, with a little dulness, was observed in the lower lobe of the left lung. Two cups of blood were drawn.

Next day, the 24th, there was a little tubular blowing. Another blood-letting was practised.

On the 26th, besides constraint in the breathing unabated, there were anxiety, agitation, and a little delirium. Tubular blowing and dulness were recognized at the base of the left lung. The cardiac beats were limited, obscure, irregular, and precipitated. In the evening, a parotid swelling had taken place on the left side. The subsequent days the anxiety and delirium continued; a parotid swelling took place on the right side; and the patient breathed his last at four o'clock on the morning of the 30th September.

Inspection of the body disclosed the following facts.

Much emaciation. Nothing extraordinary was seen in the brain. Pressure on the two parotid glands caused purulent matter to flow into the mouth by the orifice of the duct of Steno.

The right lung was sound. Part of the lower lobe of the left lung was in the state of red hepatization.

The pericardium contained half a spoonful of bloody serum, and a clot of blood. It might have been taken at first for perforation of the heart.

A soft reddish false membrane covered, on one hand, the pericardium, on the other the surface of the heart. It was then loosely adherent, and in fragments.

The heart was much enlarged, and the increase in size was chiefly owing to the left ventricle, the round apex of which was continued much below the apex of the right ventricle. The left ventricle was also of a spheroidal shape.

The right ventricle formed a sort of appendix to the left ventricle, the septum of which formed a very large prominence into the cavity of the right. The horizontal section of the left ventricle presented a disposition quite similar to that of an aneurismal sac. It contained stratified clots of blood, forming lamellæ of different density, and presenting different shades of coloration.

When the ventricle was divided by a vertical section, it was then observed that the posterior wall of the ventricle was the only part which presented the inner surface of the heart with its *columnae carneae*, and tendinous cords uncovered and natural. The external or left side of the ventricle, the anterior, the septal side, and the apex were all completely covered by firm adherent clots of blood, of which the most internal were of a light-red colour, with their surface made rough by multiplied little undulating crests, perpendicular to the axis of the ventricle, while the external clots were of a darker red colour, and their surface was so close-

ly united to the internal surface of the heart, that it was impossible at first sight to distinguish them from the substance of the organ.

These clots, when divided by the knife, showed a lamellated arrangement, like the leaves of a book. These lamellæ were very consistent but unequally so, and could be separated from each other. They presented vertical *striæ*, arranged in a direction parallel to the length of these plates, and cut by oblique *striæ*, in the manner of a leaf of fern. These striæ were formed by a series of granulations. These elastic reddish lamellæ presented no trace of organization, and no development of vessels.

This case M. Cruveilhier regards as an example of *true partial aneurism* of the heart. He adduces it as one presenting dilatation only without rupture, which he conceives necessary to constitute the *false consecutive aneurism*.

17. Cruveilhier describes in his 22d number a heart presenting the following peculiarities.

The heart was unusually elongated, viz. five inches. The ordinary length of the heart, from base to apex, is three inches. This increase in the vertical dimensions of the heart belonged solely to the left ventricle. The apex of the right ventricle reached only the middle of the left ventricle; and the transverse diameters of the right ventricle were much diminished by prominence of the septum caused by the encroachment of the latter on its cavity. The right ventricle was indeed a mere appendage to the left. There was no adhesion between the heart and the pericardium.

The heart when laid open, presented its apex converted into a firm cyst, filled with coagula of blood, which formed a mass of little cohesion, and without lamellation. These coagula were easily removed, excepting the external layer, which was very dense, organized, buried in their substance, and could neither be completely separated from the clot, nor detached from the walls of the heart.

The aneurismal sac was very firm. Its diameter represented a spheroid superadded to the apex of the heart. Its walls, which were thick, were formed by a fibrous or rather cartilaginous tissue, very dense, firm, and elastic, sprinkled with ossiform patches, and susceptible of being divided into several layers. Careful dissection of the fibrous sac showed manifestly that it was the result of the fibrous transformation of the tissue of the heart. This transformation could be traced in all its degrees. At the boundaries of the sac were seen fibrous productions, of which some were the continuation of the muscular fibres, and others were intermingled with them. The fibrous transformation at the lowest point of the apex extended beyond the sac by radii very distinctly visible in the walls of the heart, which presented a remarkable mixture of the fibrous and the muscular tissue.

From the phenomena of this preparation Cruveilhier infers that it is quite evident that partial aneurism of the heart is an aneurism by dilatation or true aneurism, and not an aneurism by laceration or a false aneurism. He allows, nevertheless, that this is far from showing that all the cases of partial aneurisms of the heart are examples of true aneurism or aneurism by dilatation; and that consequently the same theory is not applicable to them.

The application of the facts here stated, regarding the fibrous transformation of the tissue of the heart, as constituting the walls of the sac, will appear forthwith when I come to speak of the causes of this lesion.

18. The following case is given by M. Reynaud in the *Journal Hebdomadaire de Medecine*.

A man, aged about 35, who presented no symptoms which could direct attention to the state of the heart, was admitted into the *Hôpital de la Charité*, under the care of M. Lermnier. He died in consequence of formidable nervous symptoms which had taken place in the course of a severe attack of lead colic.

The heart was a little larger than it ought to be, in consequence of slight hypertrophy, with dilatation of the left ventricle.

The inner membrane lining the left cavities was thickened, opaque, and of a milk-white colour over its whole extent. The mitral valve was thickened towards its free margin, especially at the points of insertion of the tendinous pillars, which were also enlarged in size, and white and opaque. This change was most remarkable upon those chords proceeding from a principal *columna carnea*, situate at the posterior part of the ventricle. Below, and for the space of more than one square inch, the inner membrane was whiter than in other points, of considerable thickness, and was easily separated from a subjacent layer of the hypertrophied cellular tissue, which itself could be divided into several folds. These different layers had in their structure something similar to that of the arteries.

Nearly in the centre of this portion of the membrane thus changed, and in a point corresponding to the middle of the posterior margin of the ventricle, was a rounded opening capable of receiving the end of the finger, and leading into a cavity almost spherical, capable of containing a little nut, and extending to the cardiac fold of the pericardium, from which it was separated by a very thin layer of fleshy fibres. This sort of aneurismal sac contained in its most depending part a small quantity of fibrinous coagulum, which, deposited in a uniform manner, extended like a membrane to its surface. The walls of this sac were formed by a thick dense fibrous membrane, composed of two folds or layers, one superficial, thin, of an opaque white colour, the other thicker, like the middle arterial tunic, changed, and containing in its sub-

stance some fibro-cartilaginous and bony points. This membrane was continued without interruption, only becoming thick at the neck of the sac, with the inner membrane of the ventricle, the characters of which it elsewhere possessed. The muscular fibres of the heart had no part in the formation of the sac; they were separated from it by a layer of cellular tissue, and could be easily detached. The adhesion, however, appeared closer towards the part of the sac next to the pericardium.

Another sac, smaller than the first, and completely filled by a fibrinous clot, which appeared of old standing, was found at the anterior and middle part of the ventricle, near the septum. Its neck was smaller than the bottom; and the inner membrane of the ventricle, which was also prolonged into it, was thickened, and formed a sort of raised ring at its orifice. The walls of this second sac, thickened, dense, and fibrous, seemed of the same nature as those of the first. Its shape was less spheroidal; it was elongated, and, instead of its long axis being directed towards the external surface of the heart, it was oblique in the substance of the walls of the ventricle.

The orifices of the heart were healthy. The inner surface of the aorta presented some thickened elevated points.

19. The following case is given by M. Petigny in the same Journal.

Zamor, an African negro, of robust constitution, aged 53, a mason by trade, was admitted into the Hôpital de la Pitié on the 1st of October 1830, complaining of palpitations and oppressed breathing. The beats of the heart were forcible and tumultuous; the pulse hard and firm. The lower extremities were not œdematous. This patient had been in a similar state for several years; and he always derived temporary relief from blood-letting and rest, though the symptoms recurred by labour and active life. Under the use of blood-letting, digitalis, diluents, restricted regimen, and complete rest, he again recovered, and was, in some degree, convalescent on the 1st of January 1831.

He at this time rose from bed during the day, and walked about the ward; but the attempt to ascend a staircase was attended with laborious and difficult breathing. At other times he breathed freely; the pulse was a little strong and slow, but not irregular. In the evening of the 28th February he was attacked with oppressed and difficult breathing, for which blood was taken from the arm with relief. The symptoms, however, recurred; and on the 3d of March, they were accompanied with dry cough, acute pain behind the sternum and under the right mammary region, subcrepitant rattle with large bells on both sides of the chest, and fever. Blood-letting, general and local, with other remedies, were again employed with temporary relief. But on the 10th March, at 4 P. M. a fit of suffocation put an immediate period to existence.

The body was inspected 42 hours after death, and presented the following facts.

The extremities were in no degree œdematous. Both ventricles of the heart were considerably dilated, and the right was loaded with fat.

From the apex of the left ventricle proceeded an aneurismal tumour, of a size almost equal to that of the two ventricles together. It was circumscribed at its origin by a neck or circular depression; it adhered for three-fourths of its extent to the pericardium and to the diaphragm, and was free only in its superior and right fourth part.

The left ventricle and the tumour were divided longitudinally. To the external depression which marked the origin of the tumour there corresponded internally a smooth prominent border equally circular, one inch and a-half in diameter. The walls of the tumour were formed from within outwards, by a true fleshy membrane formed by the continuation of the external muscular fibres of the left ventricle, and by the cardiac fold of the pericardium, which in three-fourths of its external surface was strengthened by the capsular pericardium intimately united to the diaphragm. The thickness of these walls was generally greater than that of the auricles, and less than that of the ventricles; (it was about one line.) The fleshy fibres were wanting in two places of the right side of the tumour, which there presented two additional cavities fit to receive the extremity of the thumb, and separated from each other from before backwards, by the prolongation of one of the *columnæ carneæ* of the left ventricle. Of these two excavations the anterior was covered only by the cardiac fold of the pericardium, the posterior, which was larger but less deep, situate below, was covered both by the pericardium and the tendinous centre of the diaphragm.

The internal membrane of the heart appeared to terminate abruptly upon the prominence which separated internally the left ventricle from the aneurismal tumour. The latter was rough internally, and incrustated with fibrinous concretions more or less adherent, and disposed in concentric layers, as is usually observed in aneurisms of the arteries. In the centre was some dark-coloured blood, partly coagulated and partly liquid, and with which all the cavities of the heart were equally filled.

20. The following case is from the second volume of the Catalogue of the Preparations in the Museum of the Royal College of Surgeons in Ireland, in the pathological department of which the parts are preserved.

A deaf and dumb woman, aged 39, of very intemperate and dissolute habits, had for a long time suffered from breathlessness, violent palpitation of the heart, and extreme oppression in the cardiac region, the slightest pressure applied to

which caused intolerable pain. The pulse was quick and full, the countenance bloated and livid. At length the legs became anasarcaous, and she could breathe only in the erect posture. She expired suddenly after much agony and suffering.

A globular tumour, nearly as large in size as the heart, was found springing from the cavity of the left ventricle, near its apex, and communicating with it by a large circular opening. It passed in a direction downwards and backwards. The sac was firm, and contained calcareous deposits. Near its origin it was formed of the dilated muscular fibres of the ventricle, the lining membrane, and the adherent pericardium; a little lower down the muscle disappeared, and the two membranes came into contact; and still nearer the apex of the heart the pericardium alone remained. The cavity of the sac was completely filled by a solid white laminated coagulum.

Below the tumour it rested on the diaphragm, and anteriorly it adhered closely to the pleura, and the cartilages of the fifth sac and seventh ribs.

The left ventricle was slightly hypertrophied; its lining membrane unusually thick and opaque. The other cavities were natural.

The pericardium was thickened and universally adherent.

The lungs were sound.*

In a good memoir in the twenty-first volume of the *Medico-Chirurgical Transactions*, Mr Thurnam details the particulars of seven cases not previously published, but most of the preparations of which are preserved in different public collections; and he gives references to 58 cases of partial aneurism of the left ventricle, recorded in various works, mostly without any indication of the true nature of the lesion. These cases I need not here recapitulate, and refer the reader to them for further illustration on the nature of this lesion.

The chief use of the cases already detailed is, that they form a proper introduction to two which I am now to mention.

I may premise that, in dilatation of the left ventricle, and perhaps in some cases of hypertrophy, it is not very unusual to find near the apex of the ventricle, sometimes towards the septum, sometimes towards the left margin or the anterior part, small dilated recesses between the small *columnae carneae*, in that part of the heart, and which are filled with adherent coagula. It seems reasonable to believe that the coagula contained in these recesses must have been for some time out of the current of the circulation, and had been detained there in consequence of these parts having become at once more dilated or distended than others, and the

* Descriptive Catalogue of the Preparations in the Museum of the Royal College of Surgeons in Ireland, by John Houston, M. D., &c. Curator. Dublin, 1840, Vol. ii. p. 163.

containing walls having become thinner. Such dilated recesses I have long and repeatedly observed on inspecting the hearts of persons destroyed by dilatation or hypertrophy of the left ventricle; and I think that they must be regarded as instances of incipient aneurismal dilatation. Among other cases I may notice shortly the following as an example of this sort of lesion.

21, David Fraser, a young man of 25, was admitted, on the 7th March 1840, into the ward No. 5. in the Royal Infirmary, with symptoms of considerable dyspnœa and some orthopnœa, swelling of the abdomen with distinct fluctuation, swelling of the lower extremities, and a bloated face.

The respiration was 56 in the minute, almost entirely abdominal in the horizontal position, and in the erect more abdominal than thoracic. The lower part of the left side of the chest, but especially the cardiac region, emitted a very dull sound on percussion; and the posterior part of the chest was dull on both sides. Respiration was there totally inaudible or obscured by the moist crepitating rattle; but it became bronchial towards the spine and in the subclavicular regions. The impulse of the heart was very forcible and visible; and the beat was diffused over the whole chest, with a bellows sound heard on the left side of the sternum. Cough was pretty urgent, with expectoration of much viscid mucus streaked with blood.

The urine was scanty, and deposited a gray-coloured sediment.

He stated that these symptoms had all come on in the course of the previous two weeks; that before this time he had enjoyed good health; but that, about a fortnight previously, he was awakened in the middle of the night with violent pain shooting across the lower part of the chest, which continued till next day about eleven A. M., when it disappeared under the use of a sinapism, but was followed by breathlessness and cough, with expectoration of mucus, for which leeches were applied and a cough mixture was taken with advantage.

For the symptoms above-mentioned blood was drawn from the arm, the bowels were freely opened, and pills of foxglove and opium were given with so much benefit that, after remaining twelve days in the house, he went out by his own desire free from œdema and breathlessness.

He continued in comparative ease as to breathing for two weeks; and free from œdema for four weeks; but in the course of May his complaints returned with such vehemence and urgency, that he was readmitted on the 2d June with swelling of the belly, œdema of the legs, breathlessness and orthopnœa, and some lividity of the face.

The respiration was 36 in the minute, with a sense of impending suffocation. The physical signs were the same as formerly; and those indicating disorder in the action of the heart were more dis-

tinct and more intense than before. The cardiac beats were 112 in the minute, the first beat much prolonged and performed with a bellows murmur passing into the rasping, and it was heard not only in the cardiac region but over the whole of the left side, and on the right side of the sternum. Respiration was altogether bronchial, and accompanied with crepitating rattle in the right subscapular region, and with the same rattle in the mammary, axillary, and subscapular regions of the left side. The jugular veins were in a state of constant distension, but they always rose up much at the end of expiration.

The cardiac beats had been hitherto regular; but on the 7th they were observed to be very irregular, both in rhythm and in strength, some being given with a strong, others with a more feeble impulse. The first beat was also constantly performed now with a rough rasping murmur, much prolonged; and while the cardiac impulse was forcible and distinct, that of the artery at the wrist was feeble, obscure, and disproportionately small. They were also both heard and felt most distinctly at the lower end of the sternum.

The remedies used were blood-letting from the arm twice, then local bleeding by means of cupping several times from the chest, pills of digitalis and opium, laxative medicine to keep the bowels open, blisters over the chest, and latterly, when the foxglove was followed by giddiness, a small quantity of spirits diluted with water was allowed, and pills of squill, digitalis, and calomel. All remedies were unavailing. The œdema disappeared for a time; but the breathlessness and orthopnoea increased; and death took place on the 5th of July 1840, fully five months after the first admission, and about five months and a-half after the first manifest symptoms of the disorder.

Inspection of the body on the 6th disclosed the following facts.

Thirty-six ounces of serous fluid were found in the left side of the chest, and 52 ounces on the right side. The lungs were considerably shrunk and compressed towards the spine and mediastinum on both sides, but perhaps in a greater degree on the right side. In the right lung at the inferior part of the upper lobe, and also at the outer anterior part of the lower lobe, a small portion of lung at the margin contained extravasated blood. Its cellular tissue contained serous fluid.

In the left lung nothing remarkable was observed, except much bloody serum in its cellular tissue.

The left auricle was much enlarged, and its walls were thickened. The aortic valves were thickened, but capable of maintaining a column of water. The pulmonary valves were natural and adequate.

On the septum in the left ventricle was observed an opaque whitish spot, irregular in shape, but about the size of three-fourths of a square inch.

The whole of the left ventricle was enlarged in capacity, and its walls were much thicker and firmer than natural.

At the apex of the heart, involved in the network formed by the *columnæ carneæ*, was found a considerable quantity of firm light-red coloured lymph, adhering with much tenacity to the *columnæ carneæ* and the inner surface of the heart. The walls of the left ventricle were at this part much attenuated, as if undergoing absorption; and a distinct recess or cavity was formed beyond the outline of the inner surface of the rest of the ventricle.

The right ventricle was considerably enlarged and thickened, especially opposite the origin of the pulmonary artery. The right auricle was also enlarged and hypertrophied.

The right kidney was smaller than the left, weighing 5 ounces, but in the centre of the kidney some change in the striated structure had taken place. The left kidney weighed $6\frac{1}{2}$ ounces, and presented the same change as the right.

In this case, along with extensive hypertrophy of the left ventricle, and traces of previous endocarditis on the *septum cordis*, there was associated the sort of attenuation at the apex, which I think in several, if not all cases, leads to the aneurismal enlargement and destruction. No destruction of the apex had as yet taken place; for the inner membrane seemed entire, or at least not seriously changed. It was rubbed off apparently in some points; but the muscular fibres of the heart could not be said to be lacerated, or to have given way. I have little doubt, however, that, had life been prolonged, this might have taken place. What we saw in this heart seemed to show the early or incipient stage of the process, when, probably, the fibres about the apex being less firm, are stretched a little, so as to form the recesses out of the cavity of the ventricle in which the blood lingers, and the fibrine of the blood consequently adheres to the membrane, and begins to undergo coagulation. This is not a very rare occurrence. One case is sufficient to illustrate its nature.

22. In the following case the lesion is remarkable as being of great extent, and as taking place in the base of the septum on the side of the left ventricle.

Charles Syme, aged 38, by occupation a gardener, was admitted into the Infirmary on the 26th July 1841, with symptoms indicating the presence of hypertrophy of the left ventricle, and some change in the valves. He had from childhood been subject to rheumatism, having had not fewer than seven attacks of the acute form of that disorder, in one of which he was confined to bed for the space of ten weeks. Sixteen years back also he had a severe attack of fever; but on the exact nature of the fever no information was obtained. His health was, nevertheless, in the intervals such that he could work at his occupation. About three years and a-half previous to the time of admission, however, after one

of the most severe attacks of rheumatism he ever experienced, on resuming his occupation, he was distressed with a feeling of weight at the heart, as he termed it, which sometimes either produced or was attended by giddiness. He suffered, at the same time, from acute pains in the region of the stomach, great flatulence and eructations, which always came on two hours after taking food.

He continued to work at his calling, however, for another year, while the symptoms continued increasing in intensity, and the feeling of weight at the heart became much more intolerable. The giddiness also increased to such a degree that several times he fell down in a state of temporary unconsciousness.

He now put himself under medical treatment for a short time, but without deriving from it any beneficial effects; and he did not again applied for advice till now. The symptoms above-mentioned continued in the meantime to increase, impairing his strength and health so much that he was obliged to abandon all labour and corporeal exertion. The digestion, however, having improved much, and the flatulent symptoms having ceased, he was able to work a little occasionally during the last six months.

At the period of admission, he complained of a sense of weight at the region of the heart, breathlessness, especially on walking, moving, or making any unusual exertion, languor and faintness, and occasional fits of giddiness approaching to fainting. The appetite was bad; he had constant bad taste in the mouth, with much thirst, and the tongue was covered with a whitish fur, inclining to brown or fawn-coloured, and moist, always clammy, and tending to become dry. The complexion was of a dingy, sallow, waxy hue; the expression was feeble, sickly, spiritless, though not anxious; the pulse was 50, small; the bowels were confined and slow.

Percussion elicited a very dull sound all over the left side below the third rib; and respiration, though audible, was much obscured by the first beat of the heart, which was strong, full, and clear, and performed with a peculiar forcible knocking against the walls of the chest, as if produced by a hammer. The first beat also was greatly lengthened, being prolonged to double the usual duration at least, and it was performed with a rough murmur, partaking of the mixed characters of the rasping and the blowing sound. This first sound was not much diffused. The first beat terminated generally in the second with little perceptible interval. While the cardiac pulsations were strong, forcible, and about from 44 to 46 in the minute, the arterial pulsations were disproportionately small and feeble, and occasionally one or two beats were omitted or not transmitted to the artery, so that the arterial pulse was seldom above 40. The second beat was very indistinctly heard in the submammary region, but more distinctly

a little further back in the subaxillary region. The pulsative range was diffused over the sternum to the right side of the chest and backwards to the subaxillary region. The rhythm was very irregular, the interval between the first and the second sound being not at all times the same. Pulsation was visible about two inches below the left mamma and two inches to the right; and the vessels of the neck pulsated very forcibly and with distinct visible elevation. The bellows sound was distinctly heard in the epigastric region.

The bowels were opened by laxative medicine; and pills consisting of powder of squill and digitalis were ordered night and morning.

In the course of a few days the symptoms of breathlessness and orthopnoea were very much abated. But the physical signs continued the same as before. The pills were omitted for a few days, and a blister was applied over the cardiac region.

By this he was so much relieved that he continued much more comfortable till the middle of October, when, probably in consequence of the weather being a little cold, the breathing became laborious and difficult with a good deal of cough, and some oedema of the lower extremities took place. Upon examining the breathing by auscultation on the 18th of October, I found, that in the whole of the subscapular region of both sides, there was a moist crepitating rattle, and slight dulness was also perceptible. There was, however, no resonance of voice. The auscultation of the heart and its sounds furnished no difference; and the first beat was still hammering, prolonged, and attended with a rough bellows sound.

These signs showed that the interruption to the circulation was making progress; and that serous fluid was effused in the substance of the lungs and pleura.

The bowels were freely opened by the compound jalap powder, and one grain of powder of foxglove was given in the form of pill twice daily.

Under the use of these means by the 22d, the oedema of the lower extremities had disappeared, and the breathing was much less oppressed and laboured. The cardiac beats were unchanged. Respiration was rather faint in the right subscapular region, and the crepitating rattle was heard only in the lower and posterior part of the chest. The voice was not resonant. The pulse was from 56 to 60, regular. He was at this time, however, suffering from rheumatic pains in the right gluteal and lumbar region, and the right knee, which impeded and rendered painful the motion of these parts.

A blister was applied over the right gluteal region which was most painful, and a mixture of the meadow-saffron wine and solution of muriate of morphia was prescribed.

In the course of five days, on the 27th October, the pain in the gluteal region was much diminished. But he had now pains in the muscles of the humerus and in both elbow joints, rendering him quite unable to move them. The cardiac beats and arterial pulse were only 32 in the minute.

The meadow-saffron mixture was continued, and two ounces of wine were prescribed at bed-time.

On the 29th, the rheumatic pains were much gone; but the bowels had been often moved during the night.

The meadow-saffron mixture was stopped, and Dover's powder was ordered.

On the 1st of November he had some feelings of sickness and vertigo, which continued to the 2d. The motions were still frequent; but the rheumatic pains were gone.

Chalk mixture and catechu electuary was ordered.

On the 4th, when the pulse was at 32, he had a fit of faintness and giddiness so severe that he fell down in a state of insensibility. He was ordered to keep the horizontal position as much as possible; and the wine was increased.

On the 5th, 6th and 7th, he was rather drowsy and somnolent; while the same sort of blowing sound and irregularity in rhythm was presented by the heart.

On the 16th November, at 9 in the morning, he complained much of great pain in the region of the heart and the epigastric region, and much difficulty in breathing. The expression of the countenance was anxious and spiritless; the complexion leaden-coloured; and the extremities were livid and cold. The pulse was quicker than usual, and very small at the wrist.

For these symptoms a draught of sulphuric ether, solution of muriate of morphia, and tincture of cardamom was prescribed with benefit.

At 12 o'clock, however, the symptoms were still present. He complained much of a sense of constrictive pain over the region of the heart; and felt faint, giddy, and cold. The cardiac beats were from 44 to 48 in the minute, and performed in a more feeble manner than formerly; and only occasionally was heard the bellows sound, and sometimes at remote intervals the rasping murmur. The heart seemed as if it was no longer able for further efforts. The pulse at the wrist was exceedingly small and almost imperceptible. The face was pale, the lips bloodless, the features contracted, and the whole expression that of a person in the state preceding immediate dissolution. The respiration was about 40 and performed with great anxiety. The mental faculties were quite clear.

A sinapism was directed to be applied to the region of the heart, and warmth to the extremities, and a cordial mixture to be

given. But the pulse became gradually more indistinct until it ceased. And in less than five minutes the heart ceased to move.

Inspection of the body on the 17th November disclosed the following facts.

The heart was enlarged in all its dimensions, and weighed with the aorta and about one inch of each of its branches, 32 ounces. It measured transversely at the base five inches, and from the base to the tip it measured five inches and a-half.

The right ventricle was divided by a longitudinal incision along its posterior surface, and it was then found that its dimensions were considerably diminished at its base by a round projecting body, which felt hard and firm upon the surface as if cartilaginous. The ventricle, however, was otherwise healthy in its interior; its *columnæ carneæ* were natural; but the tricuspid valve was pushed out of its position in consequence of the body now mentioned projecting into the ventricles; and, of its three *laciniæ*, one was no longer visible, in consequence of the projection of the tumour now mentioned.

The right auricle was considerably enlarged in its dimensions, especially the muscular tip, the pectinated muscles of which were strong, large, and firm.

The left ventricle was found to be considerably enlarged in all its dimensions, but especially towards the apex, which was rounded and very capacious; the mitral valve was nearly healthy, as were also the semilunar valves at the beginning of the aorta.

In the *septum cordis*, in the space between the right *lacinia* of the mitral valve, and two of the semilunar valves, was a large oval aperture leading into a cavity of a spherical form sufficiently large to admit and contain a good-sized walnut.

The long diameter of this aperture, which corresponded to the longitudinal diameter of the heart, measured $1\frac{5}{8}$ inch. Its transverse diameter measured $1\frac{1}{2}$ inch. The aperture was nearly elliptical, and its margin was formed by the continuation of the lining membrane of the heart, forming a rounded obtuse edge at the posterior margin of the aperture, and a sharp firm edge at the anterior and superior part of the aperture.

The cavity, into which this aperture led, was rather larger than the aperture itself, being dilated from the margin in every direction, but particularly so towards the right ventricle, where the walls of the cavity formed the projecting rounded tumour already described.

The internal lining membrane of the heart seemed to be continued for at least half-an inch beyond the margin. Beyond that, though rather irregularly, the surface was rough, and presented traces either of clotted blood or coagulable lymph adhering to the inner surface of the cavity.

The walls of this cavity, which was formed in the substance of

the septum of the heart at its posterior part, were formed below by the septum ; behind by the back part of the right ventricle ; on the right by a membrane derived on its outside from the internal membrane of the left ventricle, and inside in the manner already mentioned above by the base of the right auricle, and anteriorly by the upper part of the septum of the left ventricle, and the lower part of the septum of the auricle.

The whole of the inner surface of the aorta was of a bright-red colour, and when this was removed by careful washing, the inner surface presented many spots and patches of steatomatous deposit, which were particularly abundant at the origin of the left carotid, left subclavian, and of the innominate.

The most prominent part of the tumour which projected into the right ventricle was in two points excessively thin, and almost diaphanous. At these points the walls of the tumour seemed to be formed by the membrane only of the right ventricle, a little indurated, and of a whitish colour, with distinctly marked fibrous structure like firm horse-hairs or strong hair-cloth ; and at one of these parts, towards the anterior part of the ventricle, it seemed so thin as if to be ready to burst into the right ventricle.

The rest of the walls of the tumour, especially near the septum, were thicker and firmer, and, so far as could be judged, seemed to be formed of the muscular fibres of the septum.

A small quantity of bloody serous fluid was found within the cavity of each *pleura*. The lungs were loaded with blood and bloody serum, which escaped copiously from incisions. Frothy fluid, at the same time, escaped from the small bronchial tubes. Upon laying open the large bronchial tubes, they were found loaded with viscid serum and puriform mucus ; upon removing which the subjacent membrane was found of a reddish-brown colour, and villous and rough in several places.

The mucous membrane of the colon presented many irregular shaped patches from which the membrane had been removed by ulceration.

This is a well-marked case of partial aneurism of the heart ; and it is quite peculiar in the situation which was occupied by the aneurismal lesion. In most of the cases, if not all hitherto recorded, the aneurismal dilatation took place in the anterior or lateral part of the walls of the left ventricle, or near the apex in the anterior and left side. Thus in the case of the Italian nobleman recorded by Galeazzi, the tumour took place on the left side of the left ventricle, not far from the apex. In that given by Walter, of which a delineation is preserved, it might be said to be formed by elongation of the apex. In the case observed by Morgagni, the tumour was situate in the left side of the left ventricle, about two inches above the apex. In the case of General Herbert, the tumour was chiefly formed by extraordinary attenuation of the apex.

In the case described by Dr Baillie, the tumour was formed by the apex being dilated into a sac or pouch. In both the cases recorded by Berard the aneurismal tumour was situate at the apex of the heart. In the case by M. Dance, the tumour was at the apex of the organ. In the case of Talma, the tumour was situate near the apex, and bulging out beyond it, and to the left side, had thrust the apex a little to the right. In the third case recorded by Cruveilhier, the tumour seemed to be formed by the apex. Thus, in at least ten cases, the aneurismal tumour was situate near or formed in the apex.

In the case by Zannini, the origin of the aneurismal tumour was situate in the lower end of the septum, and extended into the apex formed by the walls of the heart. In the first case given by Cruveilhier (12), the tumour was situate behind the left or acute margin of the heart, about two-thirds above the apex.

This is perhaps the only case recorded in which the dilatation or destruction of parts took place in the base of the *septum cordis*. According to the analysis of Mr Thurnam, among 58 cases of aneurism of the left ventricle, three were found in the interventricular septum.

The tumour or cavity, rather, was further peculiar in its characters in other respects. Its margin was sharper and more distinctly formed than in most of the cases previously recorded. It formed a sort of collar to the tumour, while it was the aperture of communication between the cavity of the ventricle and the cavity of the sac. It was also more regularly rounded than is usually the case. Its margins were firm and like fibro-cartilage.

The cavity was filled not with solid lamellar adherent coagula, as in other cases; but whatever blood it contained was semifluid, grumous, or in loose clots, which fell out on the slightest touch. The bottom of the sac alone was covered with rough, flocculent, slightly adherent matter, which appeared to have been formed from the fibrine of the blood.

The bottom of the sac or pouch made a large and conspicuous projection into the right ventricle, and, indeed, must, by its size and position, have interfered with the transit of the blood into the pulmonary artery.

With regard to the nature and origin of this cavity in the septum of the heart, it is exceedingly difficult to form any satisfactory inferences. It seems to be generally believed by all those who have most studied this sort of lesion, that all recesses in the parietes of the heart of the kind now mentioned must be regarded as analogous to, if not identical with, aneurisms of the arteries; and that they are formed by the fleshy fibres of the organ giving way at a particular point, partially, but not completely, so that while this part could no longer contract, it nevertheless was not so much destroyed as to allow the blood to escape at once from the ventricle.

Upon the mode, however, in which this laceration takes place, or the causes by which it may be produced, much difference of opinion has prevailed among writers on pathology. M. Breschet, to whom we are indebted for the first collected series of cases, and several good general ideas on the lesion, regarding it as false consecutive aneurism of the heart, and, therefore, analogous to the false consecutive aneurism of the arteries, studies to illustrate its nature and origin by appealing to the history of the cases of rupture or laceration of the heart. Many cases of this lesion have been recorded, and the successive observations of Harvey, Lancisi, Verbruggen, Morgagni, Senac, Lieutaud, Morand, Portal, Corvisart, and recently of Ferrus, Laennec, Rostan, Bland, Bayle, and the two MM. Rochoux, have furnished so much information on the circumstances in which this accident is most likely to take place, that we cannot expect to know much more on that subject. It is known that these accidents, though they may occur in any part of the organ, are, nevertheless, by far the most common in the left ventricle, and especially at the apex. This circumstance is probably to be ascribed at once to the greater thinness and weakness of the parietes at the apex, and to the strength and energy with which the left ventricle contracts. It is almost clear to demonstration, that, of any muscular organ of which the greater part is thick and strong in structure, and forcible in action, while one part is a little thinner, the latter is most likely to give way during any action of the organ unusually forcible or violent. This will, of course, be much more likely to happen where either unusual resistance is presented, as in disease of the aortic valves, or where the action is morbidly increased from morbid though partial increase in the thickness of the parietes of the heart.

M. Breschet seems to think that the position of these lacerations may be employed to explain the origin of the false consecutive aneurism of the heart, and he directs attention to the important fact, that, in the ten cases which he records, and most of which are abridged in the present memoir, in most the lesion was situated at or near the apex of the left ventricle. The right ventricle, he observes, presents nothing of this nature, nor did his researches bring him acquainted with any instance of its occurrence in the right ventricle. He allows, however, that we are not entitled, from so small a number of cases, to deduce any very positive conclusions.

M. Breschet, nevertheless, very properly refers to three conditions which have been believed, almost necessarily implied in the sort of lesion now described. These are, *1st*, softening of the tissue of the heart, that is, of its muscular fibres; *2d*, ulceration of the inner membrane; and *3d*, rupture of the muscular fibres; and while he questions the effective operation of the two former, he

advocates somewhat strongly the influence of the third cause. I must refer my readers to the original paper for the arguments by which he maintains the justice of his cause.

In point of fact, while Mr Thurnam has shown that this species of aneurismal dilatation or rupture may occur not only in the left ventricle, but in the right, and also in the auricles, the 22d case which is recorded in the present memoir proves that the lesion may take place not merely at the apex of the heart, but at the base of the septum. It must be allowed, therefore, that, though the lesion is most liable to take place at or near the apex of the left ventricle, it may be found in other parts of the heart, and consequently that the circumstances concerned in its production must be applicable not to the apex only, but to other parts.

By M. Bouillaud an idea somewhat different has been advanced, viz. that the false consecutive aneurism of the heart is one of the effects or terminations of inflammation of the muscular substance of the heart. This author informs us, "that the formation of an aneurismal cyst consecutive to ulceration of the internal and middle membranes of the heart, is accomplished by the same mechanism as that of an aneurismal cyst of the arteries. The lamellar disposition of the coagulum is as exactly the same in the false consecutive aneurism of the heart, as in the false consecutive aneurism of the arteries. I need not, therefore, dwell at length here on the anatomical description of this accident of the ulcerations of the heart. The tumour formed by the blood infiltrated and coagulated is very different in quantity. Thus it may in some instances not be equal to the size of a walnut or filbert, while in other cases it exceeds the bulk of an egg, and may even be greater than that of the two ventricles together.

"Almost invariably the aneurismal sac forms adhesions with the parietal covering of the pericardium; and to this fortunate circumstance must be ascribed the rarity of the rupture of these tumours. This adhesion is analogous, in this respect, to that which takes place in the numerous cases of ulceration, or ulcerous excavations of other organs, especially ulcerations of the intestinal glands, and the ulcerated cavities of the lungs."*

It cannot be denied that this mode of explaining the origin of the aneurismal cysts of the heart is to a certain extent plausible. Several of these cysts present appearances of ulceration; and if it could be proved that the ulceration always preceded the formation of the cysts, and was always the effect of previous inflammation, the question would be decided. This is, however, very far from being the fact, or the constant result in all cases. Not only do instances of aneurismal cysts in the substance of the heart take

* *Traité Clinique des Maladies du Cœur &c.* Par J. Bouillaud, Paris, 1835, Tome ii. p. 298, 299.

place without any indications of previous inflammation or ulceration ; but in several of the cases, indeed the majority, the lesion exists for a long time without presenting any of the symptoms of the inflammatory or ulcerative process. Thus, in the well-known case of Talma, there was no indication of previous inflammation or ulceration, and after it had taken place, and lasted for at least three years, it did not indicate its presence by any very marked symptom of any kind, and assuredly by none indicating the presence of inflammatory action, either acute or chronic. In almost all the other cases also, no conspicuous or urgent symptoms took place to denote the exact date of the commencement of the lesion, which has, in most instances, been discovered unexpectedly in examining the heart after death.

It must be allowed, nevertheless, that the inflammatory process, without proceeding to ulceration, as Bouillaud views it, may have a tendency to produce this lesion by the change which it effects on the tissues in which it is seated. It is one of the most constant, perhaps, of the properties of this process, to impair or destroy the tenacity, elasticity, cohesion, and resisting power of the animal tissues, and in none more decidedly than in the muscular. All textures after inflammation are rendered more fragile and more lacerable. This is particularly the case with the arterial tunics, with tendons, with cartilages, and with the bones, and, above all, with the muscular tissue, which becomes less distensible, less contractile, and more rigid than before. It is possible that some new deposit may have been formed in it. But even this does not seem necessary ; and the simple pre-existence of the inflammatory congestion appears to be all that is requisite to induce this sort of lacerability.

It is not improbable that these facts and considerations appeared so conclusive to M. Cruveilhier, that, in proposing another circumstance as a preliminary or predisposing cause of false consecutive aneurism, he found it difficult, if not impracticable, to exclude the influence of the inflammatory process. From various phenomena presented by the tumours and cysts in this lesion, but especially from the phenomena presented by the preparation described in Case 17 in this memoir, he infers that, in every case of false consecutive or partial aneurism of the heart, there is one of two processes in operation ; one the inflammatory action, and the other the fibrous transformation of the muscular tissue of the heart. To the latter, however, which he believes to be often primary or idiopathic, and not accompanied by inflammation, he assigns the principal place. Numerous facts, he informs us, lead him to conclude that the idiopathic fibrous transformation of the muscular fibres of the heart performs a greater part in the formation of partial aneurism than inflammation ; and if the apex of the heart be often the seat of the lesion, the reason is, that it is the weakest part of the left ventricle, and therefore the most frequent seat of the fibrous

transformation, so common a consequence of distension of the muscular tissue.

The reason why the right ventricle, he adds, is less frequently affected by partial dilatation is, that its walls are less thick and its structure more areolar than that of the left ventricle. The vigour and force with which the left ventricle contracts is the anatomico-physiological cause of its predisposition to this disease.

When the fibrous transformation has commenced in one point of the walls of the heart, he infers that the distension which takes place at each contraction becomes an incessant cause of irritation; and there are formed in this non-contractile sac clots which may serve as a barrier to oppose the enlargement of the tumour. He adds that he has seen cases in which the shape of the heart was not sensibly altered externally, though its apex presented the commencement of this fibrous sac or recess, and the presence of such a state had been denoted by no symptom during life. The correctness of this observation I can confirm from personal knowledge; and of this the case of the young man No. 21, recorded in this memoir, is an excellent example.

When, however, the part thus transformed into fibrous tissue is dilated into a sac superadded to the ventricle, or pushed beyond the level of its internal surface, yet communicating with its cavity by a narrow orifice, it constitutes the partial aneurism described by authors.

M. Cruveilhier, however, does not apply to all these tumours the name of false consecutive aneurism; and he makes a distinction between this and partial aneurism of the heart. By partial aneurism of the heart, M. Cruveilhier understands dilatation of one portion of the heart into a cyst, in consequence of the fibrous transformation of the tissue of the organ. These parts, however, may become eroded, and hence may be lacerated; and while the cardiac pericardium prevents complete rupture, either alone or by its having contracted adhesion with the capsular pericardium, the partial aneurism of the heart would then be converted into false consecutive aneurism. (Cruveilhier, *Anatomie Pathologique*, Livraison xxi.)

He maintains also that the partial aneurism of the heart commences always by dilatation, and ought, therefore, to be regarded as a true aneurism.

Throwing aside this distinction in the meantime, it must be admitted that the point for which M. Cruveilhier contends, as the main predisposing cause of aneurism of the heart, namely, the previous fibrous transformation of the muscular tissue, is one which derives considerable force from the appearance of many of the examples of the lesion. In the majority of these, their aneurismal sac or cyst has presented, as in No. 17, more or less of the fibrous

structure. In the case of the patient, Charles Syme, this fibrous transformation was remarkably distinct, both on the side of the left ventricle and also on that of the right, most so certainly in the latter, where it formed a firm strong prominent mass, convex in shape towards the right ventricle. This fibrous structure was also distinctly visible and very strong at the margin of the opening of the sac into the left ventricle. In all the cases also detailed in this paper, the fibrous structure is remarked at the margin of the orifice of the cyst, which is described as firm, elevated, and generally whitish.

The only question for consideration would appear to be, whether has this fibrous transformation taken place before the aneurismal dilatation or after its occurrence? I am not sure that any of the facts which I have recorded, or which have come to my knowledge, are capable of determining this point.

With regard to the other point maintained by M. Cruveilhier, viz. the distinction between *true or partial aneurism* of the heart and *false consecutive aneurism* of the heart, it appears to me that, in the present state of knowledge, it must be considered as a distinction rather in the degree and stage than in the nature and kind of the lesion. Several of these aneurismal cysts appear to commence at first by slight laceration, and then to be enlarged by dilatation. Several, on the other hand, especially those near the apex of the heart, appear to commence first by dilatation, and then to be enlarged by some degree of laceration. In many the two processes are conjoined; and it seems difficult to say which of them is the first. It is admitted even by M. Cruveilhier himself, that the form of the disease which he denominates *partial aneurism* is earlier and less advanced than that named *false consecutive aneurism*, and in which the fibrous transformation, not yet effected in the former, is now far advanced or completed.

One word only have I to add on the probable mechanism of such cases of aneurismal cyst as that presented by No. 22, (C. Syme.) The septum at its base becomes very thin; and if it be carefully dissected or boiled, it is found that, at the base, its muscular fibres, gradually attenuated, are stopped by cellular tissue, and that on the base, as it were, is fixed that part of the heart containing the two auricles and the commencement of the pulmonary artery and aorta. If, therefore, by any morbid action, the base of the septum were rendered fragile or brittle, or its cohesion with the auricular part of the heart were weakened or destroyed, it is not difficult to understand that it might be thus detached, and gradually made to give way and form an aneurismal sac at its base.

The most important questions, however, relating to this lesion have yet to be considered. Do we possess any means of recognizing the existence of this disorder during life? Can we prevent

its formation? Or after it is formed have we the means of arresting or retarding its progress, curing it, or alleviating its effects? On each of these points a few observations must suffice.

The first question, it is quite clear, that, in the present state of our knowledge, we must answer in the negative. Passing over the older cases, when the means of distinguishing the presence and nature of diseases of the heart were incompletely known, it appears, from the testimony of all observers from the time of Corvisart, down to the most recent, as Breschet, Cruveilhier, and Reynaud, that the existence of this lesion has been so far from being recognized during life, that it has not even been suspected; and the first knowledge of its existence has been furnished by inspection of the body after death. It is quite unavailing to say that the method of diagnosis was not so perfect and precise at the time the first examples of this disease were known as it has since become; and that, had this method been employed with due precaution, the presence of the disease would have been certainly and accurately recognized. In the case of Talma, the patient had the ablest medical advice that Paris afforded in 1826; and it can never be asserted that all the physicians then summoned were ignorant of the exact method of distinguishing the different disorders of the heart. The truth is, that the disease did not give rise to any urgent or troublesome symptoms. In the case recorded by M. Dance; in two of the cases recorded by Cruveilhier, and other cases given by Reynaud and Petigny, the motions of the heart were examined with very great care; yet it seems never to have occurred to the careful observers by whom these cases were watched, that the symptoms were in any manner caused by aneurism of the heart.

One great cause of this obscurity, it must be allowed, is the fact, that the disease has never hitherto, so far as I am aware, been found alone. It has always been associated or complicated with more or less hypertrophy of the heart, either simple or excentric, with the effects of inflammation of the lining membrane (*endocarditis*), the effects of inflammation and adhesion of the pericardium, and sometimes with dilatation. And consequently the symptoms of these lesions, which are always well-marked and prominent, have generally been the chief symptoms that attracted the attention of the physician. All that can be said is, that all the cases hitherto recorded have presented, in different degrees of perfection, the general symptoms of disease of the heart, as breathlessness, orthopnoea, violent palpitation, with increased impulse of the cardiac beats, and in some instances extended range of the cardiac action, and at length œdema of the extremities and anasarca of the lungs, and death either by slow suffocation or by sudden syncope.

M. Breschet has indeed attempted, with much sagacity, to ascertain the symptoms of the lesion from the comparative history of ten cases; and the delineation which he has traced is as com-

plete and accurate as our knowledge of the subject in 1827 could admit.

M. Breschet, however, allows that this part of the history of the disease still remains to be completed and established on the basis of new observations, and especially by calling to our aid the means of exploring the chest by careful auscultation. It would, indeed, be a fortunate circumstance for the precision of our art, if auscultation, among its other services, could claim the merit of enabling the physician to recognize this lesion at an early period of its existence. But even this little advantage it has not hitherto furnished. It may be doubted whether our therapeutic measures could be in the smallest degree benefited.

Reynaud has since that undertaken the same task from the analysis of thirteen cases in an able memoir in the *Journal Hebdomadaire*. Still more recently, viz. in 1838, Mr Thurnam has, from a more ample collection of cases, endeavoured to give general results, illustrating both the pathological relations, the etiology, and the diagnosis of the disease. (*Medico-Chirurgical Transactions*, Vol. xxi., London, 1838.) The only general conclusion which a candid reader can deduce from the whole of these attempts is, that the diagnosis is beset with the greatest obscurity, uncertainty, and difficulty.

Before I conclude these observations, however, I feel that my duty as an hospital physician and a clinical teacher, requires me to state candidly and frankly the diagnostic inferences which I drew from the symptoms of the case of C. Syme at the different periods of his disorder; and as these inferences were formed after frequent and careful exploration of the action of the heart, the lesson, however discouraging to myself, may be useful to others. It is only by recording our progress and noting our mistakes that we can hope to rectify them, and render the art of diagnosis precise and accurate. To the first case I need not advert in this light, because, perhaps, the lesion was too slight to cause peculiar symptoms amidst so much disease; and the diagnostic inference from the first had been, that the patient was labouring under excentric hypertrophy of the left ventricle.

When C. Syme was first admitted, the strong impulse of the cardiac beat, and its peculiar hammering shock in the interior of the chest, with the visible pulsation, the diffused pulsative range, and the prolonged bellows sound, led me to infer the existence of excentric hypertrophy of the left ventricle. Soon afterwards the irregularity in the rhythm and succession of the beats, and a peculiar tumbling, jerking, and spasmodic motion of which the heart was the occasional seat, with the rasping murmur of the first sound, led me to infer that, besides excentric hypertrophy, there was considerable disorganization of one or other of the valves of the left chambers, that is, a thickened, tuberculated, and steatomatous or cartila-

ginous state of the valves, with more or less inflexibility, and contraction of the apertures.

The question next to be considered was, which of the valves was affected in this manner? Was it the mitral valve or the aortic semilunar valves? The impulse was still very forcible, the first beat prolonged and rasping, and the pulsative area extended, while the pulse at the wrist was small and contracted. This last symptom showed that a small stream of blood reached the aorta; but it did not determine whether the minuteness of the stream arose from the contraction of the aortic orifice or of the auriculo-ventricular. At the first, from the peculiar position where the rasping murmur was most distinctly heard, I inferred that it was the mitral valve that was diseased, and the auriculo-ventricular orifice contracted. From observing afterwards, however, that the murmur was more distinct near the sternum, and combining with that the fits of giddiness and faintness, which seemed referable to a deficient supply of blood to the arteries of the brain, I inferred that it was more likely that the disorganization and contraction was seated in the aortic valves. This was the ultimate conclusion at which I arrived; and, in giving an account of the case before the fatal termination, I gave a view of the facts and arguments afforded by the general symptoms, and the physical signs, and the train of reasoning employed. It is a proof of the inefficiency of our diagnostic means in several diseases, and of the fallacy of many of the signs which we are told denote particular lesions with great certainty, that I believe I convinced both myself and my pupils that the conclusions thus formed were perfectly correct and well founded, and that in this case we were to expect excentric hypertrophy and disease of the aortic valves, and contraction of the aortic aperture. These inferences were, however, in a great measure subverted by inspection of the body. The left ventricle was indeed found to be hypertrophied with enlargement of its cavity; but the aortic valves, though not quite sound, were by no means in the state of disease expected or capable of producing the irregular rhythm, the prolonged rasping murmur, and the small, contracted pulse at the wrist which was so conspicuous a feature of the disease. Neither was the mitral valve in any degree diseased to account for the symptoms. There was no tuberculated, warty, or steatomatous thickening, and no contraction of the auriculo-ventricular aperture. The principal lesion was then discovered to be the aneurismal cavity at the base of the septum.

In comparing carefully the symptoms observed during life with the appearances found in the heart after death, while I have been unable to discover any error or omission in the former, I am quite unable to trace any connection between them and the peculiar lesion found. Of course the fact must be admitted, that an aneu-

neurismal cavity at the base of the *septum* produces irregularity in the rhythm of the beats of the heart, prolongation of the first beat, and the rasping murmur, and is attended with a small contracted pulse, or allows only a scanty stream of blood to enter the aorta, and consequently produces a small arterial pulse and occasional fits of giddiness and faintness. But are we to regard these phenomena as dependent on the mere aneurismal cyst, and the mode in which it impeded the due contraction of the ventricle, and interrupted the stream of blood in its progress to the aorta, or on the situation of the cyst, which was so peculiar in this case? These questions can be answered only by conjectures, which I am unwilling to introduce in this paper.

In conclusion, I have to say, that at present we possess no precise diagnostic means to determine the presence of this lesion. Its presence can be rendered merely probable when we find it associated with symptoms of hypertrophy, irregular cardiac action, like jerks or spasmodic twitches, rasping murmur, fits of faintness and giddiness, small irregular arterial pulse, and peculiar feelings of constriction at the heart, sometimes with, often without pain.

It has been supposed or assumed by M. Breschet that we can fix the date of the origin of this disease; and, this inference he deduces chiefly from the case of Talma, and one or two others. This supposes something like sudden laceration of parts to have taken place; a fact of which we have little direct or even probable proof in the majority of cases. In truth, in most of the cases no indication of such sudden and immediate laceration was given, and it becomes impossible to apply a mere occasional symptom or accident as a constant fact. All the evidence yet collected shows that in the great majority of cases, the disease is established without any sudden or violent symptom occurring.

Like other lesions of the heart, this appears often to succeed repeated rheumatic attacks, and not unfrequently violent corporeal efforts or hard labour, and a life of dissipation and debauchery.

What is the tendency of this lesion, and what is its ulterior progress, is a question important, as affecting the prognosis and the treatment. Does an aneurismal cyst in the heart ever contract; or does it burst, and produce fatal hemorrhage, as in the case of aneurism of the arteries?

So far as is hitherto known no aneurismal cyst of the heart appears to undergo contraction. Coagula are deposited in them, and adhere to their walls more or less firmly. They also form inflammatory adhesions on the outside, between the cardiac and the capsular pericardium; and by these two processes the cyst seems to be strengthened and prevented from giving way. But nothing is observed like a tendency to contraction of the cyst and consolidation.

It is a singular and interesting fact, nevertheless, that, amidst all this attenuation and destruction of the walls of the left ventricle, their absolute laceration or rupture in consequence of aneurism is a very rare occurrence. Among all the cases recorded in the present, essay in only one, viz. that recorded by Galeazzi, did the sac give way, and cause death by hemorrhage into the pericardium; and it appears that, among the fifty-eight cases referred to by Mr Thurnam, this accident had taken place in not more than four cases; one by Rostan, published as a case of rupture of the heart, one by Mr Shaw in his *Manual of Anatomy*, and one by Sir Astley Cooper, given in the edition of his *Lectures* by Mr Tyrrell, and one by Bouillaud.

Death, therefore, is not usually produced in this lesion by the tumour bursting. Most commonly the patient expires after a long and painful state of agony, as in other diseases of the heart. In a few cases death took place suddenly.

As to the second question, whether we possess means of arresting its progress after it has taken place? the answer must be given, depending upon the conclusions now stated regarding the means of diagnosis. If we had any certain means of distinguishing the first commencement of the disease, we might recommend the observance of all those measures calculated to keep the action of the heart as tranquil as possible, and the careful avoidance of all things which might render the action turbulent and violent. It is clear, however, that the commencement of the disease and even its existence has not in any case been even suspected, and hence all precautionary measures of the kind now suggested are not thought of. It is merely possible that, now that we know that the heart is liable to a lesion so dreadful and so directly leading to the termination of life, its existence may be apprehended in certain forms of disease of the heart; and it can never be improper to enjoin the observance of all those means which are calculated to keep the action of the organ free from tumult or disorder.

The observations now made anticipate in some sense the answer to the third question. All means of cure, indeed, must be comprehended under the use of those measures which tend to allay the inordinate action of the heart. As much rest as may be practicable and consistent with the preservation of the general health, repressing all violent mental emotions, a diet rather moderate and unstimulating though not absolutely low, ~~have~~ at particular times, refraining from the use of wine and all stimulants, occasional small blood-lettings from the chest, the employment of derivatives and revellents, and due regulation of the alimentary functions and excretions, comprehend all that the physician has in his power, to alleviate the sufferings of patients labouring under this disease.

PART II.

CRITICAL ANALYSIS.

- ART. I.—1. *A Treatise on Diet, comprising the Natural History, Properties, Composition, Adulterations, and Uses of the Vegetables, Animals, Fishes, &c. used as Food.* By WILLIAM DAVIDSON, M. D., M. R. C. S. E., Lecturer on Materia Medica and Dietetics. 12mo. Pp. 383. London, 1843.
2. *Food and its Influence on Health and Disease, or an Account of the effects of different kinds of Aliment on the Human Body, with dietetic rules for the Preservation of the Health.* By MATTHEW TRUMAN, M.D. 12mo. Pp. 240. London, 1842.

THE progress of chemistry begins at length gradually to unfold the exact relation of composition between the animal frame and the substance of vegetables, and between the substance of vegetables and those parts of inorganic nature from which the nourishment of both animals and plants is ultimately drawn. Ammonia, carbonic acid, and water charged with some minute portions of inorganic matter, chiefly saline and drawn from the soil, are the materials out of which vegetation works all her varied productions. Again, the animal kingdom derives its supplies almost exclusively from vegetable nature. That all flesh is grass, and that the substance of animal bodies is of the matter of the earth, are not merely lofty metaphors, but facts based on the surest evidence.

Common salt, oxygen, and water, are the only substances which such animals as man obtain directly from the mineral kingdom. All the other constituent elements of the human frame, and there are nine or ten, besides oxygen and the elements of salt and of water, enter under organic forms, either as vegetable aliment or the parts of animals feed on vegetables.

It is common to exclude salt, air, and water, from the order of aliments, and air and water do certainly act a part distinct in its character from the office of aliments. But salt, though placed among the condiments, serves a very different purpose from the rest of the order of condiments. Salt derived from some source

is indispensable to digestion; it ought to be regarded as a true aliment, since it affords a substance essentially necessary to the constitution of the gastric juice, certainly not the least important secretion in the animal economy. Here, then, is a substance essential to health which is conveyed directly into the living frame from the mineral kingdom, and which, without impropriety, might be termed a mineral aliment. If salt be withheld, health suffers. We do not so well understand the particular uses of certain other bodies hitherto regarded as of secondary importance in the constitution of the animal solids and fluids, such as sulphur, phosphorus, iron, and the like, yet we cannot doubt that any accidental deficiency of the elements of this order must prove injurious to the health. On the signs of such a deficiency, and on the most advantageous mode of supplying it, we are still much in the dark. To insure a sufficient supply of salt there is a distinct appetite or instinctive craving implanted in man. And it may be conjectured, we think, on reasonable grounds, that man's natural aversion to the frequent repetition of the same article of food, or his desire of occasional changes in his daily fare, has the effect, if it has not the express object, of securing more completely against such deficiencies. It is already ascertained that, among the alterations in the relative proportions of the organic constituents of the blood, arising in certain states of disease, one is the deficiency of the blood-globules, namely, in chlorosis and anæmia, and that the use of iron for a short time as a remedy diminishes this disproportion. Here, then, is another instance in which an inorganic substance acts as an aliment. Nor do we see why it might not be maintained that the pica which often attends chlorosis, the appetite for non-alimentary substances, is an instinct, or the remains of an instinct implanted, to procure an additional supply of that metal which exists in almost every mineral substance around us. The supply of iron in health is obtained, doubtless, from the aliments which man consumes. Now chlorosis cannot be traced to a deficiency of iron in the food; the deficiency of iron in the blood during this disease must depend either on the scantiness of the food, owing to loss of appetite, or on the inability of the nutritive organs to extract from the aliment a sufficiency of iron for the wants of the system. We thus obtain the important inference in dietetics, that the nutritive powers may be unable to extract an element of the body from the ordinary aliments in which it is contained, and yet that it may be introduced at that time with advantage directly from the mineral kingdom.

¶ We should be disposed, then, so far to deviate from the common methods of arrangement, as to set down salt and oxide of iron as the foundation of an order of mineral aliments, and to consider, if our limits permitted, whether any other substances, from

what is already known, can claim a place in the same order. We will only remark, that phosphate of lime seems likely to belong to the same order in certain cases of disease.

Though water and oxygen are introduced into the living frame directly from the mineral kingdom, there is, as we remarked above, a line of distinction between them and the substances which have just engaged our attention.

Water is indispensable to animal life ; yet it is not an aliment in the animal frame, as it is in the vegetable world. In the process of vegetation, water is plainly decomposed, so that its elements shall become part of the vegetable tissue. Compare the quantity of hydrogen which chemical analysis shows in an acorn, with that calculated to be contained in an oak produced in the course of a thousand years, from a similar acorn, and some idea is obtained of the quantity of water that must have been abstracted from mineral nature by a single tree in the course of that time.

But it distinctly appears that the animal frame, so far from consuming the water supplied to it from the mineral kingdom, yields up in a given time a larger quantity than it receives. Or, as water is continually decomposed in the vegetable kingdoms so it is as constantly re-formed from its elements in the animal kingdom.

With respect to the oxygen derived from the atmosphere, whether in the process of respiration, or introduced into the stomach by the deglutition of saliva, it may be remarked that all of it seems to be consumed in the production of carbonic acid and water, both of which are continually thrown off as excretions—so that this oxygen cannot be regarded as nutrient. The oxygen which enters into the constitution of the animal solids is derived from organic compounds, whether vegetable or animal, received into the stomach as food.

We see therefore, that, unless, as above proposed, salt, oxide of iron, and the like be regarded as a peculiar order of nutritive agents, all the substances strictly termed nutritive are drawn by the animal kingdom from the vegetable, that is, from the mineral kingdom through the vegetable kingdom.

There is a singular antagonism between the animal and the vegetable kingdom, in regard to their respective modes of nutrition.

Both organized kingdoms encroach on the original domain of mineral nature. The carbonic acid of the atmosphere has supplied the carbon of the soil, the carbon of plants, the carbon of animals ; the water of the earth's surface has supplied its elements to both ; the ammonia which abounds in volcanic regions, and which spreads from these through the atmosphere, has afforded the nitrogen of both plants and animals ; the potass of plants was derived from the disintegration of rocks, felspar, basalt, and the like, and their soda from albite, &c. ; and the phosphates of both

kingdoms from the numerous minerals in which these exist in small quantity in almost every part of the earth.

While, then, the process of vegetation is continually consuming the ammonia, the carbonic acid and the water of inorganic nature, the animal kingdom is as constantly restoring to the mineral kingdom those substances which the vegetable kingdom had consumed. Or the animal kingdom is without interruption engaged in re-converting the products of vegetation made use of as food into water, carbonic acid, and ammonia. Thus a species of circulation arises between the two kingdoms. Ammonia, carbonic acid, and water, enter by the leaves and radicles of plants, and are converted into various nutritive principles of the animal kingdom, together with oxygen—all of which, after passing through the animal frame, are again thrown forth in the shape of water, carbonic acid, and ammonia, which are now prepared to renew the same course as before.

Liebig has remarked, after giving the fullest demonstration of what some physiologists still affect to doubt, namely, the purification of the atmosphere during the process of vegetation, by the conversion into oxygen of the carbonic acid produced by the respiration of animals,—another circulation which places in a striking light the adaptation of the several departments of nature to each other.

The decomposition of carbonic acid in the process of vegetation, as is well known, takes place under the sun's rays, and hence takes place most effectually where the sun's rays are brightest, as in the intertropical regions, but there is a continual circulation of air from the polar and temperate regions to the intertropical regions, and back towards the poles, as is indicated by the trade-winds on both sides of the equator, and by the prevalence of westerly winds in the temperate zone, so that if the power of the sun be insufficient to decompose all the carbonic acid contained in the atmosphere of the higher latitudes, the same air will ere long be subjected to the vivid influence of a tropical sun aided by the vigorous vegetation of the same warm regions.

But it is time to leave such reflexions which bear on Dietetics only as general rules for the investigation of the subject and to betake ourselves to the examination of the works before us.

Dr Davidson's work is a close-printed duodecimo volume of nearly 400 pages, embracing in epitome, besides some preliminary topics, the whole subject of aliments and drinks.

The work is divided into two parts. The first part includes a chapter on digestion; a second on indigestion; a third on the alimentary principles of the various kinds of food; a fourth on the diet of man during the various periods of life; a fifth on the time of eating; a sixth on the diurnal (daily?) quantity of

food required by an adult ; a seventh on the diet during various diseases. The remaining chapters of the first part are on drinks, condiments, and cookery.

The second part of the volume is entirely dedicated to short notices of each particular aliment, vegetable and animal, with the exception of two short notices, one on poisonous fishes, the other on spoiled or decayed animal food.

The chapter on digestion is brief and popular in its character. That on indigestion is on the whole unobjectionable ; though rather too general and without much attempt to distinguish the numerous forms even of idiopathic indigestion. We can hardly agree with him that it is useful, in some kinds of indigestion, to evacuate the acid ferment by emetics. Emetics remove the acid matters for the time, but have no effect in preventing the tendency to the generation of acid, nay, if persevered in, they must tend to increase it by weakening the digestive organs. Emetics are not the rule but the exception in indigestion. It is often useful to begin the treatment with a brisk emetic, when the disease is connected with a general deficiency of the abdominal secretions, as of the stomach itself, of the bowels, of the liver, and pancreas, and with a dry skin,—a state apt to arise in persons not particularly prone to dyspepsia, from unusual confinement within doors, and severe application to business or study.

Speaking of the proper diet in indigestion, Dr Davidson says, " Among animals, the muscular fibre or the flesh of the young is the most tender, such as veal and lamb, and according to this law ought to be more quickly digested than beef or mutton. The contrary, however, is asserted by many respectable writers, but such has not been the result of my observation, when the cookery was simple and the quantity eaten moderate. It will often be found, upon careful inquiry, that when these articles of diet have been mentioned as the causes of indigestion, either too large a quantity has been taken, or too much gravy, fat, membrane, or gelatinous accompaniment has been swallowed along with it. And though animal substances are much less liable to generate lactic acid, in the stomach of a dyspeptic individual, than those of a vegetable kind, the gelatin of young animals frequently, under such circumstances, causes ascendency ; and hence the muscular or fleshy parts should alone be used."—P. 6.

We must still think that, even with this precaution, lamb and veal are less digestible than mutton and beef. And as respects veal at least, Beaumont's table confirms the prevailing opinion. But as this is a point of considerable importance, we quote the evidence supplied by that table, and leave our readers to judge for themselves. Out of seven observations made on the digestibility of veal in St Martin's stomach, there is no shorter period of digestion marked than three hours and forty-five minutes, and

that with the advantage of increased exercise ; in three instances four hours were required with moderate exercise ; in one four hours and a-half ; in another four hours and forty-five minutes ; and in a third five hours and a-half ; all with moderate exercise. In the same table there are sixteen observations on the digestibility of beef ; in one instance, with moderate exercise, no more than two hours and forty-five minutes were required ; in two, three hours, also with moderate exercise ; in five, three hours and a-half, namely, three with moderate exercise, and two with increased exercise ; in one, three hours and thirty-eight minutes, with moderate exercise ; in one, three hours and forty-five minutes, with rest ; in one, four hours, with moderate exercise ; in two, four hours, with rest ; in two, four hours and a-quarter with rest ; and in one four hours and a-half, also with rest. So that in six out of the sixteen instances there was the disadvantage of rest, by which the period is almost uniformly increased ; while in the observations on veal there was no such disadvantage.

Beaumont's table does not indicate the quantities of the kinds of aliment used in each experiment, the knowledge of which is essential to a fair scientific inference ; but the practical conclusion is decidedly against the veal, even if it be assumed that it was taken in greater quantity ; for in the application of dietetics to practice, it matters little whether an article disagrees with the stomachs of most people, on account of its abstract indigestibility, or because a like number of persons cannot resist the temptation of taking it in excessive quantity. It must be admitted, however, that, in judging of the fitness of particular aliments for any case, when a sufficient control is held over the patient, that digestibility and quantity should always be considered jointly, and that a considerably greater range of dishes may be allowed to the valetudinarian, if he affords security that he will deduct from the quantity of each article in proportion as it is pronounced to be less digestible.

It may be remarked in Beaumont's tables, that the period required for the digestion of aliments in general is, with few exceptions, shorter when the article is taken at breakfast than at dinner, and this difference of result we are disposed to ascribe, not so much to the greater activity of the stomach in the morning, as to the smaller quantity of most kinds of food employed at breakfast than at dinner.

We cannot help thinking that the morning activity of the stomach is too often overrated, and that a substantial breakfast is apt to be recommended with too little reserve.

When a person is to be in the open air, engaged in bodily exercise for the most part of the day, such a breakfast will generally be productive of no inconvenience ; but if the hours are to be employed at the desk, or in any sedentary occupation, the sub-

stantial breakfast too commonly gives rise to very uneasy feelings, a sense of weight and distension in the region of the stomach, parched mouth, dry heat of the hands and feet, and a degree of restlessness marked by a tendency to frequent change of attitude, and the inclination to get up at intervals and take a turn about the room. After some hours, relief is obtained, and this state of things may often continue for years without any considerable aggravation of the disorder. It is looked upon as constitutional, and the sufferer becomes reconciled to bear what he considers as beyond remedy. But to put the suffering and the daily interruption to the efficiency of one's exertions out of view, it cannot be altogether safe to permit the living frame to be subjected every day to such an irritation. And the remedy in most cases is not difficult. Let the two eggs be reduced to one, let ham or meat of any kind be altogether avoided, unless where no egg is taken, and then let the quantity be very moderate; let the hot rolls be exchanged for plain slices of the loaf with butter, or dry toast and butter, and let the quantity of the tea or coffee taken be diminished in proportion to the strength of each, and the supposed victim of constitutional dyspepsia will begin to know the new luxury of feeling comfortable and unembarrassed for mental exertion, during the most efficient part of his day. If towards two o'clock he begin to be exhausted, a slice of bread and butter, or a bit of dry toast, washed down with a small quantity of weak soup, will quite support his strength till dinner-time, unless that be unreasonably late.

We quite agree with Dr Davidson in what he says of fried bacon to breakfast.

"A certain species of highly spiced bacon-ham is said to have cured many persons of dyspepsia, when cut into very thin slices, fried, and taken to breakfast. Although it may readily be admitted that there are some individuals, with weak digestive organs, who can assimilate fat pork or bacon without much inconvenience; yet a more satisfactory explanation of the majority of the cases alluded to, may be given, upon the facts, that a small portion only of the article is swallowed; that it is highly spiced; that a stimulating empyreumatic oil is generated during the cookery, and that the latter, in conjunction with the spiceries, occasions the flow of a greater quantity of gastric juice."—P. 10.

No more pernicious error could creep into dietetics than the belief sometimes inculcated on high authority, that pork is a very digestible kind of meat. Beaumont's tables show that pig's feet and young pig are very digestible, but that pork, both salted and fresh, required a much longer time for solution than beef, mutton, veal, venison, or pig. In the second part of his volume, Dr Davidson has made the following very judicious remarks on pork.

"Pork was considered by the ancients as the most nutritive of all

aliments, and on that account was employed in the diet of the *athlete*. It abounds more in fatty matter than any other kind of animal food, and is therefore very nutritious when thoroughly digested ; but strong assimilating powers are required to effect this. It is by no means well adapted for those who have delicate digestive organs, being liable to produce nausea, putrid eructations, &c. It is rendered more digestible when slightly salted, the salt seeming to correct its tendency to putrescency. Of all kinds of animal food, it is the best adapted for this process, for little salt is required. It rarely acquires an over-degree of saltiness, and generally remains succulent, sapid, and more tender than beef or mutton. The flesh of the young pig is considered more digestible and less stimulant than that of the full-grown animal. Like that of other young animals, it abounds in gelatinous matter, and its fat is less strong and oily."—P. 273, 274.

The chapter on the alimentary principles of the various kinds of food is brief, and rather popular than scientific. Reference is briefly made to the views brought out in Liebig's recent work on Organic Chemistry ; but the plan of Dr Davidson's volume does not permit him to enter into a full exposition, or into any critical examination of those views.

The two following chapters, the one on the diet of man during the various periods of life, and the other on the time of eating, are brief, but made up of judicious remarks. The sixth chapter gives a short view of a very interesting part of dietetics, namely, the daily quantity of food required by an adult. Dr Davidson has collected from several sources some of the most instructive facts ascertained on this subject, such as the daily allowance to each man on board British ships of war, the victualling of troops in the voyage to the East Indies, Dr Dalton's report of his own diet, as recorded in his Diary, the facts ascertained as to the diet attended with health, and that productive of disease in the Millbank Penitentiary, the facts reported by the Poor Law Commissioners as to the diet of the Irish peasantry, and that of paupers and criminals in confinement, and the like.

He then proceeds as follows :—

" The following inferences may be drawn from the foregoing facts and statements ; but which, it must be admitted, are capable of great modification, according to circumstances.

" 1. Persons engaged in laborious occupations can be supported on 40 ounces of solid food daily ; two or three ounces additional may in a number of cases be advantageous, and this quantity will support the stamina of life more effectually, if it contain a fourth or fifth part of animal flesh or other animal preparation.

" 2. Those employed in ordinary labour, or who have ordinary exercise, require about 32 ounces of solid food, of which a fourth or fifth part may consist of animal substances.

"3. Those who are constantly confined to the house, without exercise, can be supported on 24 ounces of solid food, containing a fourth or fifth of animal flesh, or the same proportion of other animal product."—P. 32, 33.

The chapter on the diet during diseases contains a good selection of the received precepts on that head. In speaking of the diet in accidents, fractures, &c. Dr Davidson might have noticed as deserving of trial the gelatinous diet which has recently been recommended, partly on speculative grounds, partly on alleged facts observed in the practice of hospitals. The views, indeed, taken by Liebig respecting gelatine as an article of diet are beyond measure interesting, and if confirmed even in their principal features only, will afford us general principles of extensive application to the regulation of diet in various forms of disease.

In the vegetable kingdom there is no substance corresponding to gelatine, no substance that is identical with gelatine in composition and properties. It is an azotised compound, it consists, like albumen, fibrine, and caseine, of oxygen, hydrogen, carbon, and nitrogen, yet it is not to be regarded as a compound, or form of proteine, that master-principle in the nutrition of animals, of which all the principles capable of maintaining life at all for a continuance of time, whether animal or vegetable, are but forms or compounds. Gelatine is not, like the albumen, fibrine, and caseine of both organized kingdoms, a form of proteine, though, as containing nitrogen, it may be considered as allied to it. Gelatine does not, like the albumen, fibrine, and caseine of both kingdoms, yield proteine when acted on by potass, nor like these, does it give a purple colour with hydrochloric acid; in short, it is destitute of the characters of a form of proteine.

Animals fed on gelatine alone invariably die of starvation; gelatine contains no proteine, and cannot yield the constituents of the blood, and of the capital solids, which are albumen, fibrine, caseine. For, according to the views on which these observations are founded, the powers of the animal frame do not extend to the conversion into proteine of substances which do not contain it; these can only convert one form of proteine into another, or extract proteine from those aliments in which it already exists. Hence blood, essentially a compound of proteine, cannot be produced from gelatine, and thus the animal confined to a merely gelatinous food dies after a time.

But though gelatine cannot repair the entire waste of the blood, or renew the substance of those tissues which are composed essentially of albumen, fibrine, or caseine, it is not without a certain important use in the nutrition of animals. The gelatinous tissues, those in which cellular substance abounds, are numerous, though they do not rank among the capital solids. Gelatine is in truth

the chemical substance into which the cellular tissue is changed by boiling. And, therefore, the organic tissue of the bones, that is, all that is commonly termed the animal matter of the bones, or all the substance of the bones, besides their earthy constituents, is gelatine; the organic tissue of the tendons is gelatine, the organic tissue of the ligaments is gelatine, the basis, at least of the skin, is gelatine, and also the basis of the membranes is gelatine.

Through the blood, then, gelatine may serve for the nutrition of such tissues, even though the blood is not found to contain gelatine in its unaltered state. In short, there is reason to believe that gelatine, when supplied as food, does contribute to the repair of the gelatinous tissues, though it be well ascertained that this substance is not essential in the form of food, and that its place in the nutrition and repair of the tissues, above termed the gelatinous tissues, can be otherwise supplied. For the material required in the nutrition of these tissues can be unquestionably afforded by the compounds of proteine when gelatine does not enter into the composition of the food. And thus we can understand why the nutrition of these, as of the capital solids, is sufficiently perfect in herbivorous animals and in man, confined to a vegetable diet, provided that diet contain compounds of proteine. Yet it is probable that it costs the living system less labour, a less effort to repair the gelatinous tissues from gelatinous animal food, than from the several forms of proteine.

If, then, this view be correct, the application of it to direct the kind of diet proper for certain diseases and injuries, and for the convalescence from sickness in general, is sufficiently obvious. Certain kinds of vegetable food contain albumen, fibrine, and caseine, the forms of proteine essential to the repair of the blood and of the capital solids, and what is necessary for the nutrition of the blood and these solids from such kinds of vegetable food, is not the assimilation of them to the substance of that fluid and these solids, but simply the extraction of the proteine contained in them. But these kinds of vegetable aliment contain no gelatine; they cannot nourish the gelatinous tissues otherwise than by being changed into gelatine, a process which becomes unnecessary, a laborious process for the living system, which becomes unnecessary when gelatinous animal food is added to those kinds of vegetable aliment in the diet of the sick and convalescent; or we here deduce from speculative grounds what experience has long taught in a more limited form, that the diet in diseases generally, and particularly in the diseases and accidents to which the gelatinous tissues are liable, should consist of vegetable food containing forms of proteine, namely, albumen, fibrine, and caseine, together with animal gelatine, because the vegetable forms of proteine stimulate less, while they nourish effectually, at as little expense of labour,

and because animal gelatine affords the nourishment required by the gelatinous tissues with a much less effort to the living frame than the forms of proteine, whether animal or vegetable.

Doubtless, the plan of Dr Davidson's volume forbade him to enter at length into topics of this kind. But we wish, for the sake of the student, to whose wants this book is in many other respects excellently adapted, that he had explained in a few words the views founded on Mulder's discovery of proteine, which, whether finally adapted or not, are destined to play a principal part for some time to come in all our discussions respecting the nature of aliments, the process of digestion, and the nutrition of living bodies. We do not think that the word proteine occurs in Dr Davidson's work, yet little more than one sentence would have explained its signification. Albumen, fibrine, and caseine, the great nutritive principles of the vegetable kingdom, have the same organic composition, that is, contain exactly the same proportions of oxygen, hydrogen, carbon, and nitrogen, as the corresponding nutritive principles of the animal kingdom, animal albumen, animal fibrine, and animal caseine. The term proteine (I take the first rank) represents this common organic composition; but it is not merely a word; for every one of these six substances can be changed into proteine by the abstraction of certain inorganic elements, such as sulphur and phosphorus. The blood and muscular flesh are composed of little else but proteine. Hence the process of nutrition, whether life be supported by vegetable or animal food, is not strictly a process of assimilation, but merely (as before remarked) a process of extraction. It is in the process of vegetation that assimilation takes place,—by which proteine is formed out of the inorganic constituents of water, carbonic acid, and ammonia.

Our readers will be able to judge for themselves of the manner in which Dr Davidson's task is executed in its principal department, namely, that which treats of particular aliments and drinks, from the passages which we are about to extract.

“**SODA WATER.**—This is a dilute solution of bicarbonate of soda in water, which is highly charged with carbonic acid gas. A pint of water seldom contains more than forty grains, but frequently much less, of the soda, and the quantity of carbonic acid also varies according to the efficiency of the apparatus employed in its manufacture. When well prepared, the cork, when freed from the wire and slightly loosened, should be propelled from the bottle by the force of the contained gas. Some manufacturers of soda water add a little carbonate of ammonia to give it pungency. It is occasionally imitated by druggists, who, for this purpose, add bicarbonate of soda and tartaric acid to the requisite quantity of water contained in a bottle, and immediately cork it, while the wire is applied in the usual way. I have noticed this occasional fraud, chiefly because the preparation is not so well adapted for the treatment of cholera,

diarrhœa, and other affections of the stomach and bowels, as real soda water, exciting more irritation in these organs. Soda water, when of good quality, is agreeable, light, and, next to pure water, one of the best drinks that can be employed under almost all circumstances. In cases of dyspepsia, it is useful in correcting acidity, and the carbonic acid gas communicates a gentle stimulus to the digestive organs. In all diseases accompanied with retching, vomiting, or irritability of the digestive organs, such as cholera, diarrhœa, dysentery, &c. it is a valuable and grateful drink. In such cases, however, the quantity taken at once ought to be small, such as a wine-glassful; but this rule applies to every other diluent. Soda water has also been strongly recommended in the deposition of the phosphates from the urine; the excess of carbonic acid keeping the earthy salts in solution, while the deposition of lithic acid is prevented.—Pp. 53-54.

From the chapter on condiments we extract the following passage:—

“The caper shrub is a native of the south of Italy, the Grecian islands, and various parts of Asia Minor. It is mentioned by Theophrastus; and has been cultivated in France from time immemorial. It is reared extensively in France and Italy in the open fields, but this country is chiefly supplied from Sicily. The caper bush is about three feet in height, trailing and rambling like the bramble. The flower buds are the parts of the plant chiefly used; but in the south of Italy, the fruit, which is an oval capsule, is also prepared as a pickle; and both have a slightly bitter, acid, and aromatic taste. Capers are gathered when very young, for they decrease in value as they enlarge in size; and their collection forms a daily occupation for about six months. As they are gathered, they are thrown into a cask, containing salt and vinegar sufficient to cover them. The most green and smallest in size are reckoned the best, and are named *nonpareils*, and the second quality *capucines*. Filings of copper are said to be added to the first pickle, to communicate a green colour to the capers.”—P. 80.

Under the head of Cherry we find the following notice of kirsch-wasser and maraschino.

“The celebrated spirit called Kirsch-wasser is prepared from this fruit in the following way, according to Mr Loudon. ‘Take bruised cherries in which the greatest part of the kernels have been broken, let them remain in a mass till the vinous fermentation is fairly established, after which the process of distillation is commenced and continued as long as the liquor comes over clear.’ The best kirsch-wasser is made at Alsace in France, at Wirtemberg, at Berne, at Basle in Switzerland, and the wild black gean is preferred for its manufacture. The liqueur called Maraschino is made from a small acid cherry named *marasca*, which is found abundant in the north of Italy and Dalmatia, and what is manufactured in the latter country is considered the finest. The process employed in making it is

very similar to that adopted in the manufacture of kirsch-wasser, the difference consisting in the addition of honey to the bruised cherries, and this substance or sugar is added to the spirit after it is distilled. It is stated that genuine maraschino is very difficult to be procured, the greater part of that which is sold being kirsch-wasser mixed with water and honey or water and sugar."—P. 218.

Under the head of wines there is the following notice of Masdeu, a wine, as we think, not very long known in the British wine market.

"MASDEU.—This wine is made at a vineyard named Masdeu, in the department of the Eastern Pyrennees, and has recently been introduced into this country, being shipped from port Vendres. It has a deep colour with a violet tinge, pleasant aroma and flavour, and is thought to resemble old port. It is generally mixed with a little brandy."—P. 195.

Of vegetables we extract his notice of sea-kale as an example.

"*Sea Kale*.—*Sea Cabbage*.—*Crambe Maritima*.—*Cruciferae*.—THE CABBAGE TRIBE.—Sea-kale is a native of Britain, France, Sweden, the coast of the Mediterranean, and grows in the sand on the sea shore. The whole plant is smooth, covered with a very fine farina, and has a sea-green colour. Its radical leaves are large and sinuated, its flowers white, and they smell strongly of honey. It was first introduced into gardens about the middle of last century, and blanched by a cover of sand, litter, earthen pots, &c. It is now pretty generally cultivated and forced in gardens like asparagus. In the wild state the young spring shoots, and the stalks of the unfolded leaves, blanched by rising through the ground, are frequently used. The ribs of the larger leaves are sometimes dressed as asparagus. In its properties it is similar, and is by many considered not inferior to asparagus. It is eaten with butter, and forms an excellent addition to soups, but requires long-continued boiling before it is sufficiently softened in texture. By forcing, it may be had in perfection from November till May."—P. 162-163.

Of fruits we quote the following.

"The citron is a native of Media, and from thence passed into Persia and Greece. Dr M'Fadyen states that it is the fruit *Hadar*, 'the fruit of the tree that is beautiful,' mentioned in Leviticus, which the people were directed on the feast of tabernacles to bring with the young undeveloped leaves of the date-palm before the Lord. This injunction is observed by the Jews at the present day, and great care is taken to distinguish the fruit by its mammillated appearance. This is a shrubby tree, from eight to ten feet high, the fruit is large, sometimes half a foot in length, ovate, with a protuberance at the top, usually nine-celled, each containing two or three seeds. The pulp is white, acid, the rind yellow, thick, hard, irregular, odoriferous, and contains a fragrant essential oil.

"USES. This fruit is seldom eaten in the raw state, but is generally made into confections. The juice is used to flavour negus,

punch, &c. The rind is esculent both in the raw state and when made into a preserve. Two very fragrant essential oils, namely, the *essence of citron* and *essence of cedra*, are employed in perfumery."—P. 226.

Under the head of fruits we must notice a slight error. Speaking of the banana, the *Musa sapientum*, Dr Davidson says, "this tree is also known by the name of Indian fig." It is the banyan, not the banana, that is the Indian fig, the *Ficus Indica*, one of the largest trees known.

What Dr Davidson says of the hare will serve as a specimen of his account of the animals fit for food.

"*The Hare.*—*Maukin, Scotland.*—*Lepus Timidus*—*Leporidae*.—THE HARE FAMILY. There is scarcely a country, from the torrid zone to the poles, where the hare is not found in some of its varieties. In the neighbourhood of the North Pole it becomes white during winter, and congregates into troops of several hundreds. The hares are caught in traps, and the skins are collected on account of the fur, which is used in the manufacture of hats. Those of Italy, Spain and Barbary are smaller than those in Britain, and the variety peculiar to the Milanese country is esteemed the best in Europe. The hare was considered by the ancient Britons an unclean animal, and this notion is still held by the modern Jews and Mahometans; but by every other people, whether barbarians or refined, the flesh of this animal is esteemed. It is a remarkably timid creature, and nature seems to have given it no other means of defence against its numerous foes but swiftness. All its senses seem calculated to promote its flight. The eyes are large, and placed backwards on the head; the ears are also large and moveable, so that it can collect sound from every quarter; the muscles are strong without fat, and the hinder are longer than the fore legs. The hare lives chiefly upon grass, roots, leaves, fruit corn, and upon the bark of trees during winter, thus frequently doing great injury to young plantations and gardens. When tamed it is fed on garden herbs; but the flesh of those that are thus reared is inferior in flavour. The hare is generally about eight or nine pounds in weight.

"*USES.* The flesh of this animal is generally dark-coloured, but in Peru, the Cape of Good Hope, and at the North Pole, it is whitish. It is dense, dry, and devoid of succulency; but when moderately tender is not very difficult of digestion, as it contains very little fatty matter. It is often used along with the blood in the formation of soup, which has a very agreeable and savoury flavour. When the flesh of the hare is intended to be eaten, a young animal ought to be preferred, and it should be kept for several days or until the fibre becomes tender."—Pp. 269–270.

Under the head of various organs of mammiferous animals we find the following passage.

"*THE STOMACH, &c.*—of the ox is used in many parts of Scot-

land, under the name of '*tripe*' as a favourite dish. The stomachs of ruminant animals contain gelatin, albumen, muscular fibre, and are allied, in their nutritive and digestible properties, to ordinary meat. When tender, and boiled with milk, this dish is very agreeable, light, and digestible. Soup made of this article is a popular remedy for diarrhœa and dysentery."—Pp. 275–276.

Our author has said of tripe what he should have said of haggis, which is made in the sheep's stomach. But tripe is certainly not peculiar to Scotland, and if not known to all nations and languages, is at least in general esteem over Europe, and is a favourite at once at the tables of the great, and on the humble board of the peasant.

One or two quotations, besides, will close our specimens of this work.

"*The Ptarmigan.*—*Lagopus Vulgaris.*—*Tetraonidæ.*—THE GROUSE FAMILY.—This bird is a native of Europe and America, but is confined to the most alpine districts. It is now very scarce, and the range of the Grampians is considered its most southern British station. It inhabits the most barren and rocky spots, which are very difficult of access. It is nearly of the same size as the red grouse, and is reckoned a stupid bird. Its weight is about 19 ounces. During summer, its plumage is cinereous, tinged with brown, with black and dusky spots and bars. In winter it is nearly white.

"*USES.* The flesh of this bird possesses dietetic properties similar to those of the red grouse. Immense quantities of ptarmigan are caught in Norway and Lapland by snares made of horse-hair. They are kept in a frozen state, and shipped for the various ports of England."—P. 288.

"*The Whitebait.*—*Clupea Alba.*—*Clupeidæ.*—THE HERRING FAMILY.—This small fish has been considered by some authors as the young of the shad; but Mr Yarrell has proved it to be a distinct species. The whitebait fishery in the Thames is carried on to a considerable extent, from the high estimation in which this fish is held by the inhabitants of London, who often visit Blackwall and Greenwich to enjoy a fish-dinner. It is caught chiefly during the months of June, July, and August, and sometimes in September. Mr Yarrell is of opinion that if the particular mode of taking this small fish was known to the fishermen, it would be found in some of the other rivers of the south and east coasts. It has been discovered in the Humber, and also in the neighbourhood of Queensferry, Scotland, and in the Solway Frith. It is taken in long bag-nets from vessels moored in the tide-way. The upper part of the back of the whitebait is of a pale greenish-ash colour; the cheeks, sides and belly are silvery-white. It feeds on crustaceous animals.

"*USES.* This fish is considered a delicacy of the highest kind, particularly when cooked according to a certain method. Pennant states that it is reckoned very delicious when fried with fine flour."—P. 337.

In a work of this kind there is little room for novelty or originality. Judicious selection of the materials, and accuracy in the details, are the qualities by which the author's praise is to be measured. We think these qualities are conspicuous in Dr Davidson's work. The volume is comprehensive; it includes a great deal of most useful matter, it is, moreover, cheap and portable, and will, we are persuaded, be of valuable aid to the student of medicine and young practitioner.

We proceed to notice Dr Truman's work, entitled "Food and its Influence on Health and Disease." This volume contains much less than the last work. It is, indeed, too short to be regarded as anything more than an introduction to the subject. At the commencement of this volume, we find a short account of the proximate principles of animal food, in which no reference whatever is made to the important views developed on this subject in Liebig's work. This, however, may be regarded as excusable, since Dr Truman's volume was published no more than three months after the appearance of Liebig's Organic Chemistry.

Dr Truman's work is not a systematic account of aliments and drinks, but a collection of interesting or amusing notices on various topics connected with dietetics.

It is better adapted for the general than for the professional reader. We fear it is not entitled to be named as a professional work. The object of it is plainly rather to amuse than to instruct, or stand as a book of reference for the information regarding diet required by the medical practitioner.

Take as an example the following passage from the section entitled "Animals taken as Food."

"Goats and kids are eaten in most countries where they are found. Elephants are considered delicacies in Cochin China; and when the king, or any of his viceroys in the provinces, has one of these creatures slaughtered for table, pieces of it are sent round to all the neighbouring persons of rank, as marks of favour and attention. These animals are also eaten in South Africa. Camel's flesh is used as an article of diet in Egypt; the ancient Romans were particularly fond of the heels of this creature when young, 'Cameli calcamenta tenerima.' In China rats and moles are sold by weight, for food, in the markets. The dead rats thrown overboard from the shipping at Whampoa are picked up by the natives and used as food. The Mandingoes eat moles and squirrels. The inhabitants on the coasts of the Polar Seas, the Esquimaux, Greenlanders, Laplanders, Samoieds, Kamtschadales, &c., eat whales, walruses, seals, bears, beavers, otters, badgers, foxes, &c. The Normans, Flemings, and English are stated to have formerly prized as food the smaller kinds of whales met with in the Bay of Biscay. Whales tongues are said to have ranked among the delicacies of the table during the middle

ages. The Caffres eat lions. Bruce, the celebrated traveller, was, however, pronounced to be an impostor, because he stated, on his return to England, that he had eaten a piece of a lion in the north of Africa. The *Bradypus melanotus* is a common article of diet in South America, and is said to have the flavour of boiled mutton. The tapir and the armadillo are eaten by the Brazilians. The opossum is eaten in Peru and New Holland ; and the kangaroo in Australia. Monkeys are consumed for food in different parts of both Asia and America."—Pp. 14–16.

Some of our readers may possibly feel an interest in the information that our new allies the Chinese have a great dislike to milk.

"The inhabitants of several immense tracts of the globe entertain a marked distaste for milk. The Chinese, the inhabitants of Java, and of the other islands in the Indian Archipelago, have almost as great an aversion to it as we should have to blood ; and similar objections extend also to cheese and butter among these people. Sir George Staunton informs us, that when the gentlemen composing Lord Macartney's embassy to Peking wished to be supplied with milk, they had great difficulty in finding a person who understood the management of cows. At last, however, a man possessing the requisite information was procured, and embarked, with two cows and the proper nourishment, in a barge, to accompany the English ambassador's yachts upon their water-journey. The great distaste of the Chinese for milk is the more extraordinary, when it is recollected that many of their articles of diet are to us of a most filthy and disgusting nature. A similar dislike to it is entertained by some of the aboriginal inhabitants of the tropical regions of America, which perhaps may in some measure be accounted for, by the absence of animals which could afford a very abundant supply of it, before Europeans introduced our common ruminants into that part of the world. Others regard this accordance of taste with that of the Chinese as an argument in favour of a tradition that exists, of a regular communication having been formerly kept up between the inhabitants of the east of Asia and those of the north of Mexico."—Pp. 29–31.

Even cannibalism does not escape being pressed into the service of dietetics.

"*Cannibalism*.—Cannibalism seems to have been practised by different people in all ages, and at present is common among many barbarous nations. The general prevalence of this custom proves the correctness of an assertion made by an Oriental poet, 'that man is more extravagant in his habits, and more singular in his tastes than any other animal.' Human flesh is said to have the flavour of pork, and to be as tender as veal. The Cyclops, the Lestrygonæ, and Scylla, are all described by Homer as anthropophagi, or man-eaters. Circe and the Syrens first entrapped their victims by pleasure, and then devoured them.

"Diogenes, Chrysippus, Zeno, and all the stoics, contended it was very reasonable for men to eat one another. Livy asserts that

Hannibal, in order to increase the hardihood and ferocity of his soldiers, used occasionally to have them fed on human flesh. However much such practices may shock us, they have occasionally been adopted, in periods of scarcity, and under circumstances of great excitement, in more modern times, by some of the most civilized nations on the earth. St Jerome says that some of the inhabitants of Britain were cannibals; in the reign of Henry I. the Scots are stated to have killed and eaten some English, at Galloway. Schiller, in his 'History of the Thirty Years' War,' informs us, that the inhabitants of Lower Saxony were compelled to exist partly on cannibalism, in consequence of the dearth of provisions, caused by the devastations committed by the contending armies. The populace in Paris devoured the mutilated remains of the celebrated but unfortunate Maréchal d'Ancre, and the same class of people at the Hague ate the heart of their great countryman, De Witt. Louis XI., King of France, is said to have drunk the blood of children for the benefit of his health. During part of the thirteenth century, cannibalism was very generally practised by all classes of society in Egypt. All sorts of stratagems were had recourse to for the purpose of entrapping people, to which physicians were particularly exposed; for persons pretending to be sick, sent for them under pretence of asking their advice, but really with the object of killing and eating them. The propensity to feed on human flesh has sometimes manifested itself in pregnant females. Prochaska relates an account, on the authority of Schenk, of a female, who was with child, being seized with an irresistible desire to partake of the arm of a baker, which she happened to see uncovered; and she prevailed on her husband to induce the baker, for a sum of money, to let her have a bite at it. Another woman, in the same state, killed her husband for the purpose of eating him, and salted his body in order that it might remain longer fit for food."—Pp. 43-45.

By-and-bye we find Dr Truman descanting on Geophagism.

"*Geophagism*.—Among the variety of substances taken as food some nations eat quantities of earth. The Otomacs live almost wholly on it for months together, in the years when provisions are scarce, and are so fond of it that they continue to eat it when well supplied with food. The negroes of Guinea, the Javanese, the New-Caledonians, and many South American tribes, eat clay as a luxury and the Guajeroes, on the west of the Rio de la Hache, carry a little box of lime with them, as sailors do a tobacco-box. The German workmen at the mountain of Kiffhönser are stated to spread clay instead of butter on their bread: they call it stein-butter, and find it satisfies their hunger like other food, and is very easy of digestion. Dr Russell in his 'Natural History of Aleppo,' mentions that a kind of fuller's earth, called byloon, is brought to that city in great quantities, and carried about on asses to be sold in the streets. This earth is mixed with dried rose-leaves, and made up into balls: it is principally used in the bagnio, by way of soap for cleansing the hair, but a great quantity is eaten by pregnant women and sickly girls. The inhabitants of Capua are related to

have formerly paid a tribute to the Neapolitans for a kind of earth called leucogæum, which they made use of in the preparation of a dish named alica. The banks of the Mackenzie River, a few miles above the Bear Lake, contain layers of a kind of unctuous mud, which the Indians in that neighbourhood eat occasionally during seasons of scarcity, and also take it even at other times for an amusement. It is said to have a milky taste, and that the flavour is by no means unpleasant. An earthy substance found on the banks of the river Kamen-da-Maslo is eaten in various ways both by the Russians and the Tongousi. It is of a yellowish colour, and not unpleasant in taste, though it is pernicious to the health, producing various disorders, as the gravel, &c. In India lime is commonly eaten with the betel-leaf."—Pp. 64–66.

Again, "All edible earths most likely contain portions of organic matter, which is the reason of their being taken as food. Such, at all events, has been found by Professor Retzius to be the case with the bergmehl, or flour of the mountain, at Degerfors, on the frontiers of Lapland, which is eaten in times of scarcity by the inhabitants, made into bread with the flour of corn, and of the bark of trees. According to Retzius, it contains the remains of nineteen different forms of infusoria with siliceous carapaxes, several of which are similar to those belonging to some of the animalculæ met with in a living state near Berlin. The earth-worm swallows large quantities of moist earth, which always has minute particles of animal and vegetable substances mixed with it, and this small quantity of nutriment is sufficient for the subsistence of this creature. Many marine animals, echinodermata, fish, &c. seem to feed almost exclusively on sand, but then that sand abounds in fragments of shells, which have been reduced to powder by the rolling of the waves on the shore. All these facts show how parsimonious Nature appears to be of organic matter, since such great care is taken that none of it shall be wasted."—Pp. 66–67.

We quote below Dr Truman's whole article on Wine; and we think it will be difficult, to show, in what respect, any part of it bears reference to the regulation of health, or the cure of disease.

"*Wine.*—The invention of wine is hidden in the darkest obscurity; it is prepared from the juices of many fruits containing saccharine matter. The vine seems to have been first cultivated for the purpose of making wine in the warm countries of Asia. It is indigenous to the Holy Land. Noah found it in the land of Canaan, as it is shown by the twentieth and twenty-first verses of the ninth chapter of Genesis:—'And Noah became a husbandman and planted a vineyard; and he drank of the wine, and was drunken.' The Phœnicians introduced the vine into Greece, from whence it passed into Italy; and the Romans carried it into France, Switzerland, and Germany, where it was planted on the banks of the Moselle, Maese, Rhine, Neckars, and Donau. In ancient times, wine was so rare in Europe, that it was seldom used except at the sacrifices to the gods.

It is curious to see how many different nations have prided themselves on being able to resist the intoxicating properties of wine. Darius, the son of Hystaspes, caused it to be recorded in his epitaph, that, among the other valuable qualifications he possessed, he could bear more wine than any of his subjects. When Cyrus was preparing to attack his brother Artaxerxes, King of Persia, he published a manifesto stating he was more worthy of the throne than his brother, because he could swallow more wine. Before the Romans became degenerate, the young men under thirty years of age, and the women all their lifetime were prohibited from drinking wine, except at a few religious ceremonies. The custom among these people of saluting female relations originated, it is supposed, from the desire to ascertain if they had been drinking wine. These restrictions were gradually removed as luxurious habits became more general. The Romans, in drinking the health of one another, made use of the toasts 'Bene mihi,' 'Bene vobis.' They also frequently took as many cups, 'cyathi,' as letters in the names of the persons they drank to, or as they wished years to them, on which occasions they were said 'ad numerum bibere.' They also had a favourite custom of drinking three cyathi in honour of the Graces, and nine in honour of the Muses."—Pp. 88-90.

We next give some extracts from our author's article on Cookery.

"The only essential now required to be imparted to our food is, that it shall be palatable—the wholesomeness or unwholesomeness of it being rarely inquired into. In former times, probably, this was not so much the case, for the greatest men of antiquity are frequently described as being engaged in cooking their own food; most likely to ensure its being prepared in the fittest way, according to the notions then entertained, for preserving the health, Homer's heroes seem often to have dressed, and even killed, their own victuals. It is mentioned in the Odyssey, that when Achilles entertained Priam he slaughtered a snow-white sheep, which he delivered to his two friends to skin and dress; and, after it was cooked, he divided it himself among his guests. Many of the most illustrious generals and magistrates among the Romans, during the earlier periods of their history, as Curius, &c., also frequently cooked their own dinners, serving them up in the plainest manner. Most of our knowledge of Roman cookery has been derived from the writings of Apicius. There were three persons of this name, all famous for being *bons-vivans*, and for their skill in cookery; The first lived in the time of Sylla; the second in the time of Augustus and of Tiberius; and the third in the time of Trajan. The second, however, was the most celebrated for his skill in the gastronomic art; being mentioned, on this account, by Seneca, Pliny, Juvenal, and Martial."—Pp. 100-101.

"Pliny often mentions the ragouts invented by Apicius, whom he calls 'Nepotum omnium altissimus gurgis.' The cookery of the Romans was probably more refined than our own, for, it is stated, they frequently regaled themselves with the flesh of hawks and young asses; to make which tender and palatable must have re-

quired some skill and care. Their cooks were so dexterous, they could serve up a pig or boar, broiled on one side, and roasted on the other. Another favourite way of dressing a boar was that of stuffing it with thrushes, larks, beccaficoes, &c., the whole being steeped in the choicest wines and the richest gravies. This was named the Trojan manner, (in allusion to the Trojan horse, which was filled with warriors,) and was so expensive that at one period it was prohibited by a sumptuary law."—Pp 102–103.

After mentioning proofs of the extravagance of Lucullus, Cleopatra, Heliogabalus, he goes on to say,

"The *lanx*, or *scutella*, a large platter covered with different kinds of meat called *Mazonomum*, was commonly introduced at the Roman feasts.

"Vitellius had an immense dish of this description made, which he named the Shield of Minerva: it used to be filled with an incredible variety of the rarest and nicest kinds of meat. This emperor was in the habit of taking breakfast, dinner, and supper at different people's houses on the same day, on each of which occasions it never cost his entertainers less than 400,000 sesterces, or about L.3229, 3s. 4d. a piece. It is calculated that in one year he wasted, in this manner, L.7,265,625. In modern times, though extravagance in eating is very great, it has never amounted to anything like this. The chief cause of the entertainments of the Romans costing so much proceeded from so many of their dishes being composed of the tongues, brains, and other small parts of animals, great numbers of which required to be killed before a sufficient quantity of material to make a dish of any size could be procured. Our dishes, on the contrary, being chiefly composed of the larger parts of animals, are necessarily less costly. According to the notions of the present day, the Duke of Newcastle, who used to have thirty or forty legs of mutton cut up, to get a sufficient number of pope's eyes to make one dish, was guilty of unwarrantable extravagance. In our feasts the decorative part, when carried to an extreme degree, and the wines, generally cost more than the materials composing the dishes. The Romans paid great sums for cooks, who were slaves; and, if they became much celebrated in their vocation, always fetched a high price in the market. In modern times the professors of cookery are liberally rewarded for their services. The principal cook at one of the most celebrated club-houses in London is stated, at one time, to have had a salary of L.1500 per annum—a much larger stipend than is enjoyed by any Professor at either of the Universities, and far exceeding the value of the greater number of church livings. Many cooks in the families of our aristocracy have L.300 per annum, exclusive of perquisites. The culinary art in this country, therefore, cannot be said to want patronage."—Pp 105–107.

We gladly cite the following passages, to show, that here and there Dr Truman's volume contains passages not without interest to the profession.

"Children who are not allowed a sufficient quantity of animal

food are very apt to exhibit a low state of vitality, which is favourable to the production of parasitic growths, whether animal or vegetable, on different parts of the body. They are therefore particularly subject to many cutaneous affections, which are produced by animalculæ and fungi, that make their appearance on the skin and cause it to be diseased. The common psora results from the irritation produced by an animalcule which burrows in the skin. The infrequency of this disorder among the wealthier classes of society, is quite as much to be attributed to the liberal diet they enjoy, as to the attention paid to preserve the cleanliness of their bodies. The boys at Christ's Hospital are very liable to scald-head, and many other cutaneous diseases: in fact, the former is hardly ever out of the school. These complaints result in a great measure from imperfect nutrition, as the children are not allowed a sufficiency of animal food. Nothing can be more objectionable than that in this excellent establishment, with its enormous funds, there should be kept up the system of banyan-days, as they are called, on which the boys do not get any meat at all, and very often nothing but bread and butter. No doubt this abstemious plan is followed, because it is considered healthy. But this opinion is most erroneous; for there is little doubt if the boys had a more liberal animal diet allotted to them, and if great care were taken that all the articles of food given them should be of the best quality, most of the cutaneous diseases with which these children are so frequently tormented would soon disappear, and they would be altogether less likely to be attacked by illnesses than they are at present."—Pp. 163–164.

The following remarks are well worthy of attentive consideration.

"Full vigour of system can never be produced by starvation; it can only be obtained by a sufficient supply of materials, capable of completely developing the different organs of the body, and keeping them in repair. The instance of Cornaro, who improved his health so much by great frugality of diet, is therefore frequently most improperly quoted; for though the plan of living he followed might suit some persons, it would infallibly cause disease, and ultimately death, if rigorously adopted by most people. The account he has left of the small quantities of food he was in the habit of subsisting on is alone sufficient to show how injurious the majority of individuals would find an attempt to live in a similar manner. He tells us, that he was extremely unhealthy and decrepid up to the age of forty, when he determined on adopting a most abstemious plan of diet, and eating everything by weight. The entire quantity of food he took daily consisted of twelve ounces of bread, eggs, &c., and fourteen ounces of liquids, making altogether only twenty-six ounces of food, solid and liquid. By following this course he recovered his health, and lived to be one hundred and four years of age. Many may suppose that the long life he attained proves the healthiness of his mode of living; it was certainly healthy for him, and might be so for any other person in a similar state of body to himself: but he must always be considered as a sort of invalid, in whom the powers

of nutrition were very weak, and unable to assimilate a larger quantity of nourishment ; for if he had ever required more food, he could not have borne it, as was proved by the addition of merely two ounces of solid food to his usual allowance always causing him fever, and yet a more generous diet would, undoubtedly, have been very beneficial to him, if he could have supported it. It is by no means desirable to try and subsist upon too little food, for this practice occasionally induces a peculiar condition of the stomach, which renders it incapable of bearing the stimulus of the quantity of nourishment necessary for a vigorous state of body. In fact, in the greater number of cases of indigestion, the difficulty is to get the stomach to bear anything like a liberal allowance of food. Many dyspeptic people have an appetite, but, in consequence of the weakness of the stomach, food taken even in moderate quantities causes great uneasiness and derangement of the whole system. A common opinion prevails that indigestion is almost always brought on by over-eating : such is very frequently the case ; though too much abstinence produces similar results more generally than is usually supposed."—Pp. 165–167.

We are not disposed altogether to condemn Dr Truman's book ; but it certainly falls short of the promise of the title-page. He has expended much industry and ingenuity on the merely ornamental parts of his subject, but he has entirely failed to produce that full allowance of substantial knowledge which, common place as it may seem to him, we expect to meet with in a Treatise on Food, and its Influence on Health and Disease.

ART. II.—*Treatment of the Diseases of the Eye by means of Prussic Acid Vapour and other Medicinal Agents.* By A. TURNBULL, M. D., 12mo. London, 1843, pp. 89, and one Plate.

DR TURNBULL, already favourably known as the author of a treatise on some of the more active alkaloids of the Ranunculaceæ, has during the present year published a small volume detailing the results of his experiments on the cure of diseases of the eye by means of the vapour of hydrocyanic acid and a few other agents. Dr Turnbull was induced to employ hydrocyanic acid in diseases of the eye, from the well known fact that the eyes of persons poisoned with it in general retain a peculiar glistening and staring expression, as if the person were alive. His first experiments were made by applying the diluted acid, by means of a sponge, to the forehead, for the space of a few minutes, when the skin assumed a very red appearance, and the pupil of the eye became slightly dilated. This plan was found beneficial in several cases of incipient cataract, opacities of the cornea, inflammation, amaurosis, &c.

He afterwards found that the vapour of the concentrated acid applied directly to the eye was followed by much more beneficial effects, and could be applied without the least danger. His mode of applying the vapour was, by putting about a drachm of the acid in an ounce phial in which is a piece of sponge, and holding the mouth of the phial over the eye, and in close contact with it, the mouth of the phial being made so as to fit the eye, and allow it to be freely exposed to the vapour. Care must of course be taken not to allow the patient to smell the acid. No pain or peculiar uneasiness was experienced on the application of the vapour. Dr Turnbull also, in the same manner, employed the chlorocyanic acid, sulphuretted chyzic acid, chloruret of iodine, and bisulphuret of carbon, but found them all rather too stimulant for the eye, being in general accompanied with sensations of heat and pricking. He found the vapour of the bisulphuret of carbon, applied in the same way to swollen lymphatic glands, speedily reduced them in size. The action of all these agents, he thinks, depends on "the carbon in the vapour permeating the cuticle and coming in contact with the oxygen in the vessels, which is conveyed through every part of the frame by inspiration and otherwise, and thereby forming carbonic acid gas, which evolves heat in the ratio of the quantity consumed by the oxygen."

The cases which Dr Turnbull relates of the curative powers of the vapour of hydrocyanic acid are many of them very astonishing. Almost every disease of the eyes seemed as by enchantment to yield to the powers of the acid vapour. Opacities, inflammation, and ulcerations of the cornea were removed, and left the eye sound and useful as ever, after the acid vapour had been applied daily for a month or a little longer. In one case, the humours which had been discharged years before appeared to be partially re-secreted. Staphyloma, amaurosis, and cataract, equally yielded to the acid vapour. The eye became reduced to its natural size in the cases of staphyloma; the amaurotic affection disappeared in amaurosis; and the opacity in cataract, whether depending on that of the lens or its capsule, in many cases slowly cleared under the potent influence of the vapour of hydrocyanic acid. In the detail of the cases, one fact worthy of attention is mentioned, viz. that almond or castor-oil dropped daily into the eye seemed to have nearly as beneficial an effect as the prussic acid vapour itself.

These statements, if really well founded, are in great danger of being damaged in their evidence by the uniform efficacy and success which is said to attend the use of the remedial agents. If they are exaggerated, it is clear that equal bad consequences must result to the actual credit of the remedies. Under all circumstances, it will be requisite that the remedies be subjected to further and fuller probation, before they merit the confidence of the profession.

Appended to this portion of his work, Dr Turnbull gives some extracts from the *Lancet* and *London Medical Gazette*, of cases which had been successfully treated by others, by means of the vapour of hydrocyanic acid, and which are the more valuable, as showing that the remedy has been nearly as successful in the hands of others as in those of Dr Turnbull, who appears to have had the merit of first suggesting the practice.

The remainder of Dr Turnbull's volume is devoted to the explanation of the therapeutic effects of the external application of the volatile oils to the temples and forehead in diseases of the eyes; and their internal administration in the same diseases. The oils, as pimento, cloves, lavender, cinnamon, rosemary, &c. were dissolved in alcohol, and rubbed by means of a sponge over the temple and forehead daily. The efficacy of the embrocation was more than doubled if another sponge with warm or cold water were rubbed on the forehead for a minute afterwards. The same oils were also frequently given internally made into pills, with magnesia, or formed into a powder by means of the same earth. Concentrated tincture of black pepper, ginger, capsicum, &c., appeared in many cases equally efficacious. A very few cases, consisting of instances of amaurosis, cataract, and ophthalmia, are given, illustrating the efficacy of this practice.

ART. III.—*On Injuries of the Head affecting the Brain.*

By G. J. GUTHRIE, F. R. S., Surgeon to the Westminster Hospital, &c. &c. &c. London, 1842. 4to. p. 155.

IF the practice of surgery in modern times has been simplified, improved, and rendered more efficient by the aid of the collateral departments of physiology and pathology, that which relates to the treatment of injuries of the head has shared not in a small degree in these advantages. If, indeed, we compare the practice of the older surgeons, as Paré, Wiseman, Pigray, Saviard, Martel, Le Gendre, Lapeyronie, Petit, Le Dran, Sharp, and even Gooch and Pott, with that of the best modern surgeons, we are struck and sometimes shocked at the apparently unnecessary cruelty in the employment of operations among the former, and the absence of that medical treatment which results from a knowledge of the nature and tendency of injuries of the skull. In ancient times almost everything that surgeons recommended and practised, seems to denote unbounded confidence in mechanical means, and the workman-like use of the multiplied instruments for boring, sawing, chiselling, nay even hammering the human skull, and a total ignorance or disregard of the physiological and pathological principles which ought to have formed the first and most essential guides of all their therapeutic measures. Surgeons were then

mere mechanical manipulators,—a sort of carpenters on the human frame. Of physiology they knew little and thought less. Of pathology, or the knowledge of morbid processes, their nature, and tendencies, and effects, they were ignorant of all but the name. In mechanical resources and instrumental means, they were great and brilliant. In real surgical knowledge they were infants.

In the writings of Fabricius Ab Acquapendente, Fabricius Hildanus, Paré, Dionis, and Petit, we are presented with a magnificent and formidable display of instruments for boring the human skull, searching for and removing fractured or depressed bones, and forming an outlet to blood or matter supposed to lodge within the cranium; but we find a great lack of good histories of symptoms by which the surgeon might be enabled to know when he ought to penetrate the cranium, and when he ought to refrain from such operation. The result of this is manifest in the writings of practical surgeons in general. They appear at all times to have thought, that in injuries of the head, whenever the functions of the brain were in any way affected, and even previous to that, it was indispensable to perform the operation of trepanning. It seems not in general to have been thought that this was in itself a dangerous injury to the cranium and its lining membranes and contents. Trepanning was the order of the day, and most patients were accordingly trepanned. To such a length was this fancy for operation carried, that it was employed, not merely after injuries with or without fracture, but for the removal of various diseases of the brain, as apoplexy and violent cephalalgic pain; and many persons with epileptic symptoms, and not a few with cephalæa from syphilitic, or rather mercurial disease in the skull, underwent this pleasant operation. In these palmy days of boring and sawing, it was the glory of the surgeon to trepan as many patients as possible, and sometimes to trepan the same patient many separate times. Thus Saviard relates with very commendable gravity a case in which he applied the trepan in the same patient twenty times. Mareschal and Desportes both applied the trepan twelve times; and Gooch relates a case in which he applied it thirteen times.

These circumstances are so much the more extraordinary that several of these surgeons appeared, amidst the routine rules of the day, to have occasionally formed conclusions, showing at least that the application of the trepan was not always necessary. Thus Saviard relates in his 70th Observation, the case of a man, who, in an alarm from supposed robbers during the night, struck his head violently against the architrave of the door, and received a considerable wound, with a depression of the external table of the skull, on the middle of the frontal bone. The surgeon who was called proposed a consultation, and Saviard was requested to give his opinion. As he observed no symptoms indicating depression

of the bones and compression of the subjacent parts, he recommended careful dressing in the ordinary mode of treating contused wounds. This was done ; and the broken and depressed piece of bone exfoliated at the usual time without causing the patient to keep his bed or inducing any accession of fever ; which shows, says Saviard, that it is not always necessary to trepan as soon as the skull has received an injury ; and that on many occasions we may defer this operation, until the symptoms show its indispensable necessity.

Notwithstanding the value of such an observation as this, surgeons, especially in France, continued to trepan the skulls of patients who had sustained different injuries of the head with as great freedom as formerly ; and the usual practice in many cases of fracture of the skull was to apply the crown of the trephine along the whole course of the fracture several times, so as to remove the whole of the broken bone.

Petit appears to have been the first French surgeon who admitted that trepanning itself was an operation by no means void of danger, and who made the reflection that many patients died in whom this operation was performed in the most proper manner, and after the most mature consideration. He therefore endeavoured to determine the classes of cases in which the application of the trepan was necessary, and to specify those in which it might be dispensed with.

Pott had very considerable merit in simplifying the instruments employed, and diminishing their number. But for the operation of trepanning he was a strenuous advocate ; and lost few opportunities of applying the trephine and exposing the brains of his patients. He even went so far as to recommend the operation as a measure of precaution. He seems not to have known that the great evil after concussion or fracture was inflammation, and that the best means of obviating and controlling this was not the use of the trephine, but the antiphlogistic treatment.

The example of Sharp and Pott appears to have confirmed English surgeons in the use of the trepan in almost all injuries of the head accompanied with fracture, or symptoms of concussion or compression, which were always supposed to depend upon the presence of extravasated blood. M. Desault appears to have been the first surgeon in France who doubted the propriety of applying the trepan in all cases, who conceived that it was often unnecessarily applied, and who endeavoured accordingly to treat various cases of injury of the head without operation. Mr Dease of Dublin took similar views, and showed the dangers resulting from inflammation, and the necessity of combating these and counteracting their effects. Mr Abernethy appears to have been the first English surgeon who called in question the propriety of the operation, and who showed that while many cases, in which it was the

usual practice to trepan, got perfectly well without that operation, there were others in which the chief danger arose from inflammation, and that this was likely to be aggravated rather than alleviated by the operation of trepanning. The precepts and the example of Mr Abernethy were followed by a great revolution in England; and the operation of trepanning fell into so great disuse, that it was not performed once for twenty or thirty times that it used to be performed. This change, which began about the close of the last century, has been nowhere better described than in the language of one eminent surgeon who witnessed it and could remember the contrast.

"For the symptoms remaining after concussion," says the late Sir Astley Cooper in his Surgical Lectures by Mr Tyrrell, "the trephine used to be employed; but it now becomes a question, whether it ever ought to be resorted to in these cases? What will trephining do? Probably great harm, by disturbing the brain; and, if not, no good can possibly result from it. Now for the proofs: first, that it does no good. Gentlemen, I never lecture to you but from the recollection of some case that has occurred to me, from which I form my opinion. In a former part of this lecture, I mentioned to you a case of great irritability of the stomach, produced by concussion, the effect of a blow on the forehead, which happened at Yarmouth, in Norfolk. Mr W. Cooper, formerly surgeon of Guy's Hospital, visited this gentleman, and prevailed upon him to suffer the trephine to be applied upon the part of the forehead on which the blow was received; and, when the bone had been removed, the *dura mater* was sound, and no relief whatever arose from the operation; a direct proof that it is useless. Dr Farre informed me, that he knew a person who was subject to epileptic fits after concussion of the brain. The operation of trephining was performed, and he died soon afterwards.

"Forty years ago, trephining used to be the plan generally adopted with the patients admitted into the London hospitals; many were submitted to the operation; inflammation of the membranes of the brain supervened, and nearly all died; recovery being very rare. But do our patients now die from the effects of concussion? No; by depletion we rarely lose a patient.

"After the expiration of my apprenticeship at these hospitals, I went over to Paris, to see the practice of Desault at the Hotel de Dieu; and there I found that scarcely ever, under any circumstances, did he trephine; and he was more successful than the English surgeons. Trephining in concussion is now completely abandoned."

The same liberal use of the trephine was observed in cases of fracture with depression, real or supposed, and also in cases in which the symptoms were believed to denote the presence of blood or other fluids within the cranium. It would be desirable if we

possessed the means of knowing whether any particular set of symptoms denoted the presence of blood extravasated within the skull or purulent matter formed; and if we did, if we could be sure of its exact situation, or that, by cutting out a portion of the skull we could be sure of removing these fluids, and also of removing the symptoms supposed to depend on them. But neither is our diagnosis so accurate as to insure either of these objects, nor can we be certain, that by such measures we can restore the patient to consciousness and sensibility, and the faculty of voluntary motion. Many instances are there, indeed, in which patients have recovered their senses, consciousness, and voluntary motion, without such operations being performed. Not a few have been performed in which no fluids have been found to cause the symptoms; and in other instances, where the operation has been performed, it has appeared to aggravate the symptoms and accelerate the approach of the fatal termination.

The present work, which is the production of a surgeon who has witnessed many of the effects of different sorts of injuries of the head, both in military and civil life, contains much instructive information on the nature and effects of these injuries, and, above all, on the treatment required. The author seems to be quite aware of the injurious effects of trepanning by itself, and also of the powers of the system in effecting recovery under the most unfavourable circumstances.

One of the most perplexing circumstances in the treatment of injuries of the head, is the great difference in termination of injuries, which, to all general appearance, are much the same. In some cases a mere stunning blow or concussion proves fatal, and that in no long time, either from the direct effects of the shock, from laceration of the brain, or from hemorrhage from the membranes and consequent pressure. In other cases, persons in whom the skull has been fractured and the brain exposed, or even part of it carried away, have recovered with few bad symptoms.

“ I have, however, seen some few recover from a similar injury attended by the loss of a considerable portion of brain, without any apparent defect; whilst others have fallen, and never rallied, from a comparatively trifling injury of the same part; a fact which I do not attempt to explain, although I believe that the fatal issue then occurs from some further and unperceived mischief. The result of my experience on this point is, that brain is more rarely lost from the fore-part of the head with impunity, than from the middle part; and that a fracture of the skull, with even the lodgement of a foreign body, and a portion of the bone in the brain, may be sometimes borne without any great inconvenience in the back part. During the war with the United States in 1814, a soldier in Canada was struck by a ball which lodged in the posterior part of the side of the head; the wound healed, and the man returned to his

duty. Twelve months afterwards, having got drunk, he fell down in the streets of Montreal, and died. The ball was found on the *corpus callosum*, where it had made a small hole or sac for itself. After the battle of Toulouse I had three cases, in each of which a piece of the occipital bone was driven in by a ball, which, striking directly upon it, made a hole no larger than the end of the finger: the absence of serious symptoms in these cases insured exemption from operative treatment. One case was, however, peculiar: the part injured was so exactly the size of the ball, and the bone was so clearly to be felt deep in the posterior lobe of the brain, whilst the ball had probably gone beyond it, that I thought it right to recommend the man to have the bone removed. He declined, but begged to have more to eat, which I in turn refused. He had no bad symptoms, and the wound closed in, and had healed when I left him at Bourdeaux about to embark for England. It was the recollection of these cases which induced me, after the battle of Waterloo, to recommend, in that of a soldier similarly wounded, that nothing should be done unless symptoms arose demanding the use of the trephine; as none appeared, and the wound healed, the man was sent home to Colchester, where he one day got drunk, and also fell down dead in the market-place. The ball was lodged deeply in the posterior lobe of the brain in a sort of cyst. I have never seen a person live with a foreign body lodged in the anterior lobe of the brain, although I have seen several recover with the loss of a portion of the brain at this part. My experience then leads me to believe, that an injury of apparently equal extent is more dangerous on the forehead than on the side or middle of the head, and much less so on the back part than on the side. A fracture of the vertex is of infinitely less importance than one of the base of the cranium, which, although not necessarily fatal, is always attended with the utmost danger. The treatment of these several injuries, although they may be at first sight apparently similar, cannot, and must not be alike in all; and this fact should always be borne in mind in their management. In civil life, both in hospitals and among private persons, injuries of the base of the cranium prevail, from the circumstance of their generally being the consequence of falls; whilst in military life, injuries of the base of the skull are rare, and those of other parts are common. The practice of the military surgeon is therefore more successful, all things considered, than that of the surgeon in civil life, and particularly in a great metropolis; which may perhaps account for some of the discrepancies in opinion which have existed between them."—Pp. 2, 3.

Mr Guthrie appeals shortly to the experiments which have been performed by Mayo, Flourens, and others, in order to show that it is possible to form some conclusion regarding the locality of the cerebral injury and its extent, from the nature of the external symptoms. Great severity and persistence of the symptoms, he argues, lead to the belief that the part of the brain or the spinal chord on which they depend, is directly injured, rather than indirectly affected, and that the result is more likely to be fatal. Per-

manent insensibility and loss of motion, he thinks, may depend on cerebral mischief only. The loss of the mobility of the iris implies an affection of the *tubercula quadrigemina*. Convulsions, vomiting, drawing up of the limb not affected by paralysis, stertor, difficulty in swallowing, strabismus, and relaxed sphincters, show derangement, he thinks, of the spinal functions; which, he adds, is well marked, when tickling the eyelashes causes no closing of the eyelids, the verge of the anus no contraction of the sphincter, or the sole of the foot no motion of the toes.

We are not disposed to be too strictly critical with this short, and evidently not very pretending summary, which is avowedly taken from some of those writers who have been recently attempting to fix the exact locality of particular parts of the brain affected by injury;—otherwise it would not be difficult to specify various inferences here which rest on no very substantial foundation.

Mr Guthrie adopts the ordinary division of injuries of the head into two great classes; viz. Injuries from Concussion and Injuries from Compression or Irritation of the Brain.

By the term Concussion of the brain, he says, “a certain undefinable something, or cause of evil which cannot be demonstrated, is understood to have taken place; although the effect is often clearly proved by the almost instantaneous death of the individual, or by the succession of symptoms which quickly lead to his destruction.” He then refers to the well known and often mentioned case recorded by Littre, in which a criminal, sentenced to be broken on the wheel, anticipated his fate by rushing across his dungeon, a distance of fifteen feet, and dashing his head against the wall. No external mark of violence could in this case be perceived, except a slight separation, not exceeding the third of a line, of the squamous portion of the temporal from the parietal bone. The brain and membranes were apparently sound; but the brain did not appear to fill the internal cavity of the cranium so closely as usual, and its substance, as well as that of the cerebellum and spinal marrow were, both to touch and sight, more compact than usual. That this diminution of the brain was real, he satisfied himself by replacing all the cut portions within the cavity of the skull, which cannot be done in the ordinary state of parts. This diminution of size, M. Littre, therefore, ascribed to the violence of the shock and the incapability of the brain to recover itself from want of elasticity or spring, in consequence of which the distribution of nervous influence to all parts of the body had failed in one instant.

It does not appear difficult to comprehend why a sudden and violent shock upon the skull should destroy at once the functions of the brain. But there is certainly some difficulty in understanding why it should do so, and leave no trace of injury or destruction after it. Mechanical force of any kind applied to a hard bony

case like the skull, necessarily transmits its vibrations, sometimes directly, sometimes in different directions through the skull, and this it cannot do without causing very considerable change in the internal constitution of the cerebral mass. That such vibratory motions are really produced within the brain in consequence of blows inflicted on the skull, was demonstrated experimentally by M. Gama, chief surgeon to the Val-de-Grace, the author of a good Treatise on Injuries and Wounds of the Head, published first in 1830, and afterwards, with various improvements, in 1835.

He arranged in a white glass globe, or spherical retort, several threads in different directions; and he then filled the globe with a solution of isinglass, sufficiently strong to possess, when cooled, the consistence of the brain. After cooling, he closed the neck of the retort, and he struck the vessel with an ascertained degree of force at all the parts where this was practicable,—using sometimes the hand, sometimes different bodies. Blows at the circumference of the globe showed that the mass of jelly was agitated at all points in proportion to the force communicated to it; and of the movements taking place in the transparent mass, the vibrations of the threads gave information.

The effect of a moderate blow is always very obvious at the corresponding place between the glass and the jelly, and extends to some little distance. It is seen, also, that the vibration is communicated in the direction of the impulse and diminishes gradually, and is lost in the remote points, without the possibility of being followed. By striking more strongly, the mass is for an instant detached from the vessel under the point of percussion, at the same time that a like effect is observed at the opposite point of the diameter. It is in some degree made to recoil on itself, to form instantly the interval now mentioned, and which is easily recognized at the two sides of the vessel; then it resumes its first position, without showing whether this detachment is repeated in a more feeble manner. This sort of double impulse directs, consequently, the shock to the centre of the jelly in two opposite directions; and thence, according to the laws of repulsion, it is reflected to the circumference. The threads which had obeyed the two impulses, that is, which had been carried inwards on both sides, vibrate then in a contrary direction. They assume their irregular movements, which continue some time, but in a direction no longer appreciable. It is impossible to recognize the vibrations of the globe itself under any blow, either by the eye or by the hand, whatever attention is employed.

From these experiments an exact idea may be formed of what takes place within the head, in consequence of a direct blow which produces concussion of the brain, in so far, chiefly, as the opposite point of the diameter of the place struck shall be on the spherical surface of the skull. If, for instance, the blow falls on

the upper region of the head, the effect will no longer be the same. The brain will be detached from the skull, only under the point of percussion, and the base of this cavity will sustain a sort of disseminated counterstroke, in consequence of the extent which it presents. From this experiment, it appears that the communication of motion, which causes a direct concussion, exerts its first effect from without inwards, on one or on two points, according to the force of percussion. It follows that the cerebral mass contracts on itself, either from the place struck only, or at the same time from the place and the point opposite to it. The secondary effects of the repulsive vibrations are subordinate to the first.

When the retort is held reversed, that is, with its neck downwards, and the globe upwards, and if the extremity of the neck be struck with the hand or any covered resisting body, as if to impel more deeply the cork in its neck, or if the cork itself be struck, the threads are observed to vibrate from within outwards, or in the direction opposite to that in the first experiment. The motion is not more evident at this place than on any other point of the circumference; it appears to be diffused uniformly from the centre to the circumference of the jelly-like mass, though the percussion is as energetic as possible. The vibrations of the threads show, nevertheless, as a secondary effect, that this motion is then transmitted from the circumference to the centre, but not very sensibly, and it is requisite to look very close to perceive these oscillations.

The effects last mentioned show that in indirect concussion, at least when produced through the medium of the vertebral column, represented in the experiment by the neck of the retort, the motion is distributed in the brain from within outwards. Every kind of violence, indeed, communicated through the spinal column, or by the lower jaw, impinging in its ultimate course, on some point of the base of the cranium, naturally diffuses itself from the point of impaction all round within the brain.

It is possible also to conceive a third case, that is, where violence is applied at once, directly and indirectly; and in this instance, which is common, the two species of impulse encounter each other in the interior of the brain, and there produce disorders more considerable than if either sort took place singly, though with a force equivalent to the two united.

Lastly, oblique blows on the retort produced in the threads vibrations relative to their direction, which may be easily understood from what has been said in the case of direct and indirect impulse.

The experiments thus shortly noticed illustrate the mere mechanical effects of violence inflicted in various modes on the cranium. They show that the membranes may be forcibly detached at the point, or opposite to the point of impulse; that the sub-

stance of the brain may be lacerated; and that the particles of which the brain is composed undergo vibrations more or less extensive; and that the vibratory motions thus produced may or may not be accompanied with forcible separation and rupture of vessels, but that they are always followed by so considerable a change in the constitution of the brain, and the motion of the blood within its vessels, as to cause, first, a suspension of the functions of the organ, and then such derangement in circulation as to induce inflammation.

Although these experiments, however, show the fact of great internal change and injury to the substance of the brain, they do not enable us to understand how the brain should be rendered smaller than heretofore. This is perhaps of no great moment in the question; and until we were quite certain that it was a well-established and a constant fact, it would be very idle to seek for an explanation.

It appears further that Mr Guthrie himself, in imitation of Chopart, believes that the statement made by M. Littré, regarding the brain of this suicide, was much exaggerated, in opposition to the opinion of Sabatier, who is disposed to think that it occasionally may be the case. It is certainly possible that, in consequence of great external violence, sufficient to produce immediate suspension of the functions of the brain, that organ may, with its membranes, be forcibly detached from the inside of the skull at certain points; but whether it could be diminished uniformly all round, is a matter which nothing but multiplied experience and observation can decide.

Concussion may be the result of blows directly inflicted on the head, or falls in which the head strikes on a hard body, or falls in which the body alights on some other part of the person. Of these different modes, certainly blows on the skull are by far the most effectual mode of producing concussion. In the case of falls, also, in which the head is struck on a hard body; as a hard pavement, a stone, a stone wall, the case and the mode in which the injury is produced are quite the same,—and differ merely in the degree of force with which the individual is thrown to the ground, or dashed against the hard body. Thus, a man is thrown from a horse, or out of a gig, and his head struck forcibly on a hard pavement, or the parapet of a bridge, and in either case, the injury without causing fracture is so severe that the individual is taken up senseless, pulseless, cold and pale, and the pulse does not return for a considerable time. Of this the following case may serve as an example.

“Mr B. having jumped out of a carriage, the horses of which were running away at full gallop, fell on his face, and was found senseless and motionless. Some cold water having been poured upon him, he gradually recovered, and afterwards ate a hearty dinner

drank a bottle of port wine, and walked home, a distance of three miles. He thought himself quite well the next morning, and went to bathe; but on returning about noon he felt uneasy, lay down on a sofa, began to talk incoherently, and was soon quite delirious. At one o'clock he was bled, but the symptoms of inflammation were not completely subdued until after he had lost 84 ounces of blood, the last quantity being taken away at eleven at night. The vigorous treatment adopted in this case during the first ten hours in all probability saved the life of the patient."—Pp. 22, 23.

When concussion from one or more blows on the head is so severe as to cause immediate or speedy death, the most usual result is considerable effusion of blood into the subarachnoid tissue all over the hemisphere, over the cerebellum, and at the base of the brain, where it is copious, and also within the ventricle. This extravasated blood does not proceed, however, from any single vessel, but from a general multitude of minute vessels of the *pia mater* and choroid plexus. This we have witnessed many times in persons who have received violent blows on the skull, yet without producing fracture. It may be said, perhaps, that, strictly speaking, this is not concussion only, but concussion so considerable as to produce extravasation and consequent compression. This is so far a just objection. But the fatal result in this class of cases appears to proceed not from the quantity of blood effused, but from the violence which caused the effusion.

Another effect resulting from blows, and which, we conceive, must be placed under the head of concussion, is laceration or rupture of a portion of the brain. This is most likely to take place immediately beneath the part struck, or in the direct line of the striking force; and this is usually accompanied with effusion of blood from the lacerated part, and also not unfrequently with the effusion of blood into the subarachnoid tissue over the base in the neighbourhood of the part struck. Cases of both these classes Mr Guthrie designates as those in which the symptoms of concussion are complicated by those which are commonly observed in consequence of compression of the brain. These cases are indeed the most common; for it does not often happen that any given case of injury of the head is one of pure concussion. Of this sort of injury the following cases are good examples.

"An old man fell from some steps when cleaning windows, on his forehead, which he slightly cut and bruised, and divided the left temporal artery by another small cut, which bled profusely until arrested by a surgeon. He remained in a state of insensibility for nearly two hours, when he rallied, and answered questions, although imperfectly. Pulse quicker than natural, and intermitting. He shortly afterwards relapsed into a state of insensibility, with convulsions, stertorous breathing, puffing at the corner of the mouth, and complete loss of voluntary motion; the pulse could scarcely be felt. This convulsive fit lasted about ten minutes, when his respiration

became natural, and his pulse was restored. The insensibility continued for an hour, when it was attempted to bleed him, but the pulse fell immediately, and it was not persisted in. He soon, however, became quite sensible, sat up in bed, and vomited some blood. In the afternoon he had another and slighter fit, from which he quickly recovered. On the third day I first saw him. He was then free from all bad symptoms; and said, when asked, that he had only a very slight headach. The pulse occasionally intermitted. On the fourth day he declared he was starved, became snappish and irritable, complained of pain in the head, with a quick and irregular pulse. On Saturday, the fifth day, he got up and dressed himself, had another slight convulsive fit, and fell into a state of stupefaction, for which bleeding gave little relief, and in the evening he died. From the first period of his improving on Monday afternoon until his death, sensation and motion remained. On examination a starred fracture without depression was found corresponding to the wound on the forehead, continuing to the base of the frontal bone, across the ethmoid, over the body of the sphenoid bone, breaking off the posterior clinoid processes, and extending to the basilar process of the occipital bone, but not quite to the *foramen magnum*. The anterior lobe of the right hemisphere of the cerebrum was lacerated to the extent of one inch, which part was surrounded by the usual appearances of inflammation. Some blood was extravasated on the tentorium, beneath the posterior lobe of the brain, and lymph was effused over the whole of its surface, between the arachnoid membrane and the *pia mater*.

It is possible that the convulsive fits might depend either on the loss of blood or on the laceration of the cerebrum, for they occur from either cause. On the third day he appeared to be almost free from complaint, and to have suffered from concussion of the brain only. On the night of the third, inflammation of the brain and of its membranes rapidly commenced, in consequence, in all probability, of the lacerated part not having united by the adhesive process, and of the deep internal fracture, both of which evils were beyond the curative efforts of nature. The trephine would only have added to the mischief."—Pp. 25-26.

"Mr S. was thrown from his carriage at Walham Green, at 8 o'clock at night on the 16th of April 1842, and was taken up senseless, motionless, without pulse, and black in the face from some handkerchiefs which were tied tightly round his neck. On his pulse becoming distinct, he was bled to 20 ounces and sent to London. A bruise only was found on the upper and back part of the right parietal bone. He was quite insensible, and remained so until his death. He was motionless as if dead, breathed regularly as if snoring, sometimes more, sometimes less loudly, as was his custom during sleep. Eyelids closed; pupils fixed, neither contracted nor dilated, but quite insensible to the light of a candle brought close to them. On tickling the soles of his feet, the left toes moved a little, the right not at all. On pricking them with a pin, the right toes very slightly moved, the left toes did so very plainly. Tickling the palms of the hands induced a slight move-

ment, and particularly in the left. Irritating or tickling the eyelids and cilia with a feather, caused a slight contractile motion of the left eyelid but none of the right. The eyes were always fixed in the central position; mouth closed, or nearly so, although a small spoon could be introduced with some force; pulse 78, moderately full. The head was shaved, and 24 ounces of blood were taken away at eleven o'clock, which relieved the breathing; the pulse rose to 88, and became softer. He could after this move the left arm and leg, and gradually recovered their use. When the right arm was drawn from the side, a slight effort was made to draw it inwards. The sphincters were not relaxed. Ten grains of calomel were placed on the back of the tongue. The head was kept raised and cold.

"Monday 17th. Breathed more easily during the night. Pulse 108, full and soft. Repeated the calomel, and passed the catheter, as he rubbed the lower part of his belly with the left hand as if suffering pain, and drew off four ounces of water. Ordered a stimulating enema; repeated the calomel at twelve o'clock, and took away twenty ounces more blood, which reduced the quickness of the pulse from 108 to 100. At four o'clock the use of the left arm and leg were apparently quite restored; breathing easier. The enema had been repeated, and the bowels had acted freely, and apparently involuntarily. Pulse 108. Was cupped to twelve ounces on the left temple, at the desire of his friends, who placed great reliance on it. Ten at night. Pulse 120, soft but good; breathing easy, but not quite natural; has swallowed a very little water with great difficulty when carried far back over the tongue, it otherwise runs out of his mouth; has half-opened his eyes three or four times, and has endeavoured to move in bed, but cannot stir the right side. Repeat the calomel.

"18th. Passed a better night; bowels well opened several times; urine free in a short stream; pulse 120, soft, smaller, and rather sharper. Insensibility continues; face flushed. V. S. ad. 3vj. on trial, and found to be buffed. Breathes much more freely.

"19th. Slept and snored loudly, but when shaken ceases to snore; he slightly moved the right leg once. Pulse 100, soft. Continue the calomel. Evening. Pulse 112, soft and compressible; more restless; tries to move; right foot insensible to tickling; slightly moved the great toe on pricking the sole; bowels often open.

"20th. Passed a quiet night, and was thought by his friends to be better; pulse had increased to 130. *Empl. Lytiæ inter scapulas*. Continue the calomel. Pupils contracted a little for the first time under a strong light. Died at half-past two.

"On examination, no fracture could be discovered; the *dura mater* was found adhering to the calvarium on the right side, and was slightly ossified in the course of the superior longitudinal sinus. There was no extravasation of blood either between the calvarium and the *dura mater*, or between the latter and the arachnoid membrane. Slight extravasation beneath the arachnoid on the upper part of both hemispheres, with appearances of inflammation of the membrane. The vessels of the brain were more turgid than natu-

ral; with which exception the left hemisphere appeared quite healthy. The vessels of the right side were more congested than those on the left, and there was a little more extravasation. There was a small quantity of blood in the right ventricle, the roof of which was lacerated superficially to the extent of about an inch, and one point of purulent matter was observed in its middle. The *corpora striata*, the *thalami optici*, and optic nerves were in their natural state. No defect could be found in the *corpora quadrigemina*, the *medulla oblongata*, or the spinal marrow, although the examination was most carefully made by Mr Hancock and Mr C. Gardiner Guthrie.

"The symptoms in this case were so distinctly such as might have been expected to accompany an extravasation of blood, either on or in the cerebrum, that I had little, indeed no doubt, of one being found on examination. It did not prove to be the case; and the whole of the symptoms which followed the injury must be attributed to the rupture of the roof of the ventricle of the *right* or the *same* side of the body as that which was affected by as great a loss of sensation and motion as is commonly seen in the most marked instances of extravasation into the cerebrum, or of lesion of the lower part of the spinal cord. That there might have been other mischief besides that which was actually observed, is probable; but it may be reasonably concluded, that it was not discoverable in the present state of our knowledge, or was of so small extent as to have been accidentally overlooked."—Pp. 26–28.

"Concussion induces affections of the brain and of its membranes of an equally serious nature, at a more distant period of time when the stage of stupefaction and insensibility is wanting; and it is to guard against such an occurrence that persons who suffer from falls or severe blows on the head usually lose blood. A gentleman was thrown from his gig near Hounslow, and received a very severe shock and several bruises, without feeling much hurt, or being aware that his head had actually touched the ground. He came up to town, went to bed, and got up next morning suffering only from a slight headach, and stiff from his bruises, of which he thought nothing. On the second day I saw him in consequence of headach, throbbing in the temples, sickness, and general malaise or discomfort. Being a stout young man, thirty ounces of blood were taken from the arm in a sitting posture, until he nearly fainted, when he was relieved. In the evening the symptoms having all returned, pulse 88, and full, he was bled in the erect position until he fainted, forty ounces being taken away. The blood of the morning was buffed and cupped, and the bowels had acted freely. On the morning of the third day, the pulse, which had become fuller, yielded to twenty-four ounces of blood, and in the afternoon, on its rising again, to sixteen more; after which the symptoms gradually subsided, and he appeared to be restored to health, with one interruption from irregularity in diet, which required the further loss of blood by cupping behind the ears, and some sharp purgation. His cure was not, however, permanent; for having dined out a month af-

terwards, he became delirious during the night, and required to lose sixteen ounces of blood in the morning, which relieved but did not cure him. Some pain remained in his head, the pulse continued at 90, the tongue was white, with thirst, loss of appetite, and watchfulness. Calomel and opium were now administered until the mouth became affected, when he quickly got well; although a slight relapse or two afterwards convinced him that he could not drink or lead an irregular life with impunity."—Pp. 32, 33.

"A soldier, partly in liquor, received a blow from a spade in Lisbon in the beginning of 1813, which cut the upper part of the head across the sagittal suture, and rendered him senseless. He soon recovered, and a slight fissure or fracture without depression was discovered on his being brought to the Estrella hospital. As there were no symptoms indicative of mischief, I desired that his head might be shaved and the divided parts brought together by sticking-plaster; that the head should be kept raised, wet and cold; that he should be bled to twenty-four ounces, purged, starved, and kept quiet in a dark room. The next day he said he had slept well, but that his head felt painful, as if something tight was tied around it. Pulse 66, small and hard; bowels not open. Blood was taken from the arm to the amount of forty ounces, when he appeared ready to faint. Calomel and jalap, followed by *Infus. Sennæ cum Magnes. Sulphate*, were given, and acted well, and he was greatly relieved. The calomel was continued every six hours. In the evening, however, the pain and tightness of the head returned, with a pulse of 110, hard and full, and were again removed by the loss of twenty-four ounces of blood. He remained easy until the evening of the next or third day, when the pulse quickened to 120, became small and hard, and he complained of severe pain in the head. It was evident that inflammation of the brain or its membranes had commenced, and that it must be subdued; he was therefore bled until he fainted, forty ounces being taken away. This entirely relieved him, and calomel, jalap, senna, and salts were again administered with great effect. On the fourth day he was easy, the pulse 94, soft and full, the mouth being tender from the mercury. The wound did not heal by adhesion, but by granulation; and under the continuance of the starving and purging system he gradually got well without any more bad symptoms, having been saved by the loss of 128 ounces of blood in three days.

"The wound in the scalp, and the certainty that the bone was fractured, made no difference in the treatment; nor if the scalp had been sound and the knowledge of the fracture wanting, should I have sought to ascertain the fact of the bone being injured, unless I had been prepared, on finding a fracture, to apply the trephine, which it has been shown by the result would have been unnecessary. The vigorous, and decided abstractions of blood saved the man, and, with the mercury, in all probability prevented the occurrence of those evils which our predecessors sought to obviate by removing a portion of bone."—Pp. 53–54.

Concussion is indirect when it follows a fall from some height, and in which the individual alights not, on the head, nor strikes the head directly on any hard body, but in which he alights on his feet, the knees, the pelvis, the back, or the breast. In such circumstances, while the concussing force is applied to a remote part of the body, while a violent shock is inflicted on the whole frame, the head and its contents in general partake in a considerable degree of the injury. Thus, if the individual alight on the feet, knees, or pelvis, the shock or impulse is conveyed along the spine to the base of the skull, and always inflicts violent concussion on that part, and in some instances causes fracture of the base of the skull at the same time. In certain cases the impulse is conveyed to the lower jaw, shaking and concussing the whole skull above that bone, and in some the individual striking the lower jaw against a hard body suffers in the same manner most severe and violent concussion of the brain, most commonly with fracture of the lower jaw.

A man was precipitated near midnight or towards morning out of the window of a house of at least three stories, and was found lying on the hard pavement below. It was not well known how he had struck on the ground, or whether in his descent he had not struck on some intermediate part. The thigh-bone was broken in two places. The lower jaw was fractured in three places; the wrist was much injured and contused; and the patient was in a state of insensibility, cold, and with the pulse almost gone at the wrist. When he was brought to the hospital, and attention was given to his injuries, he gradually began to show symptoms of greater sensibility, but was delirious, and complained much of pain in the jaw and the leg that was fractured. Eventually, under proper treatment, he recovered from the lesion of the brain, which had perhaps been less severe than it seemed at first sight. But extensive suppuration took place in the lower jaw, and the thigh; and of the exhaustion thus produced he died at the end of fifteen or sixteen months.

In this and similar cases, where no direct blow is inflicted on the skull, but where the concussing force is mostly spent on other parts, the brain is less violently affected; but still it suffers a good deal.

The amount of this degree of injury to the brain depends on three circumstances,—the height from which the patient falls, the nature of the ground on which he alights, and the part of the body which strikes the ground.

The first circumstance, viz the height, forms a very important element in the effects produced; for in all falls from a considerable height, as the velocity increases with the height, it follows that the body comes most forcibly to the ground. In falls from a great

height the injuries are necessarily severe, complicated, and numerous. Dr Clarke, in his *Travels in Sweden*, mentions the case of a woman who fell into a copper mine, and who was said to have been so shattered that she was crushed, it is added, to a pancake. In those unfortunate cases in which persons in this country fall down the shaft of a coal-pit, death is generally instantaneous.

In the second place, much depends on the nature of the material or ground on which the individual alights. If it be soft and unresisting there is much less chance of severe injury, and in some instances remarkable escapes after falls from a great height have thus been effected.

"Two men," says Mr Guthrie, "were brought to the Westminster Hospital apparently dead; one had fallen from the dome at the top of Buckingham Palace on the back and head of the other, who was walking unconcernedly below, and who was killed on the spot, although no bones were apparently broken. The man who had fallen from the dome—perhaps the greatest height from which any one has fallen without injury, was quite well on the third day, felt only a little stiff, and left the hospital to return to his work."—P. 10.

In this instance the person who fell from the dome at the top of Buckingham Palace was exceedingly fortunate in having such an object as a recipient in his descent from so great an elevation. For most assuredly had he alighted on the ground he must have sustained injuries, concussions, fractures of bones, and lacerations of internal organs so violent that death must have been either immediate or a very speedy result.

Take another instance of the effect of the softness of the ground, and perhaps also of the lightness and resilience of the individual falling.

"I once," says Mr Guthrie, "saw a girl of ten years of age fall thirty feet from the parapet of a house on the ground, which was rather soft; I ran to her, thinking she must be killed, but she got up, and ran away roaring and rubbing her bottom, which seemed for several days the only part inconvenienced by the fall."—P. 10.

Mr Guthrie allows that, in severe cases which ultimately prove fatal, laceration of the brain takes place, and contributes to complicate the symptoms as well as the lesion.

The effects of concussion on the functions, or the internal symptoms of the injury, have been pretty well understood since they were specified by Mr Abernethy. The present author gives what is called a practical account of these symptoms, which, though not so methodical as we could wish it to be, contains many useful hints.

"When a concussion of the brain has rendered the sufferer sense-

less and motionless, the countenance is deadly pale, the reverse of what takes place in sanguineous apoplexy ; the pulse is not discoverable ; the man does not appear to breathe. It is useless to open his veins, for they cannot bleed until he begins to recover, and then the loss of blood would probably kill him. It is as improper to put strong drinks into his mouth, for he cannot swallow ; and if he should be so far recovered as to make the attempt, they might possibly enter the larynx and destroy him. If he should appear to breathe, and be made to inhale very strong stimulating salts, they will probably give rise to inflammation of the inside of his nose and throat, to his subsequent great distress. Mild stimulants and disagreeable smelling substances, together with partial as well as general friction with the warm hands, are the best means to be adopted, and should be continued until it be ascertained that life is extinct. If the patient should recover, some signs of breathing will be discoverable, followed by a distinct inspiration, repeated at so distant an interval as to render its recurrence uncertain. At last respiration is satisfactorily established, and the pulse, which was doubtful at the commencement of the restoration to existence, becomes perceptible, although often irregular, and sometimes continues so until reaction has taken place. With this partial recovery of the natural functions of the body, vomiting is apt to supervene, and is one of the earliest and most satisfactory symptoms of returning sensibility. It was formerly supposed to be peculiar to cases of concussion, but it is often present in cases evidently of compression or irritation from external violence. The breathing becomes in general quite free ; and although it is occasionally laboured, it is rarely stertorous, which may be considered, when permanent, as a more distinct sign of continued irritation, or of compression and of extravasation, than of concussion. The sensibility of the surface is not fully established, the patient is not cognizant of any injury committed upon him, and if he should recover, has no recollection of what has passed. Mr Abernethy believed that this first stage could not last long, and that with the re-establishment of the functions of the lungs and of the heart, the second stage might be supposed to begin ; and it may be considered as commencing from the time the circulation of the blood through the brain has been partially re-established, although retarded in its progress, or irregularly or insufficiently performed. The patient is still in a state of stupefaction, although now perhaps sensible to personal maltreatment, and may remain so for many days ; he draws away or moves the part aggrieved ; he may be able to answer in a monosyllable correctly or otherwise to questions loudly put, as if to rouse him from slumber ; but if the answer should be longer it will generally be incoherent. The pupils are for the most part in a medium or in a contracted state. Stimulants were formerly given at and up to this point, with a view of reviving and restoring the patient to greater activity, and to prevent a relapse into his former state. Dissection has, however, proved that it is a state in which congestion is about to be followed by inflammation of the brain or of its membranes ; that the stage succeeding to this is one

of active inflammation, even if the patient should eventually recover ; and if he should relapse into that state of stupefactive insensibility which precedes death, sufficient evidence to account for his decease will, I believe, be always found in the laceration of the substance of the brain, in small extravasations in various parts, or in other mischief which may not be perhaps expected. Previously to this stage of fatal termination, the muscles are not relaxed and do not lose their tone, as in a similarly fatal case of compression of the brain ; the urine does not flow involuntarily until after the spinal marrow has been some time seriously implicated, and death is at hand ; which renders it necessary in all cases of injuries of the head to attend to the state of the bladder, which may become distended, and thus render the use of the catheter necessary. The urine will be acid as long as the catheter is required, and will become alkaline as soon as it dribbles away involuntarily. The bowels will at an early period be confined, and more powerful doses of aperient medicines will be required than under more ordinary circumstances, although the sphincter ani may be relaxed, and the power of retention be lost from the first, provided the injury has been very severe. When the fæces pass involuntarily, it is presumed that the cerebro-spinal axis is seriously affected, and that the excito-motory system is greatly impaired, if not wholly destroyed. When a person is insensible, it is not always easy or convenient to ascertain whether the fæces pass involuntarily from loss of power of the sphincter ani, or are discharged from the ordinary action of the bowels, of which the patient cannot give notice. It may be inferred when the urine flows in a stream, although apparently in an involuntary manner, that the power of the detrusor muscle of the bladder is only impaired. In general, certain efforts are made to evacuate the bowels, although the person may be upon the whole unconscious of the act, which show that the defect is not essentially in the *sphincter ani*, but in the want of consciousness in the brain.

“ Vomiting should not be solicited, as it may do harm when in excess, but when slight it has appeared to be beneficial. The simpler the treatment during this the period of commencing reaction, the more likely is it to be ultimately successful. The period at which insensibility ceases, and the re-establishment of the natural functions of respiration and of the circulation begins, must always be uncertain.

“ The termination of the second and the commencement of the third or really inflammatory stage, or that tending to recovery, is marked on dissection, by the vessels of the brain and of its membranes being full of blood, and showing those appearances which are indicative of inflammation. If the patient is to recover, the stupefaction, or *assoupissement*, continues, although a greater degree of sensibility prevails ; the pulse now becomes regular if it were not so before ; the skin is hotter than natural ; the patient can often be induced to show his tongue, which is white, and to answer shortly, and tell where he feels pain, although he often answers incorrectly ; he can sometimes put out his hand and help himself, and

occasionally even get out of bed. He usually turns to avoid the light, and the pupils are for the most part contracted; but no reliance can be placed on the state of the pupils at this period of the complaint; they are sometimes both dilated, or one is dilated and one contracted, sometimes dilating on the admission of light, sometimes contracting; and they may not be in the least changed until shortly before death. An alteration from the ordinary state of the pupils does not prove the absence or presence of any serious general injury, but only that a particular part of the brain has been more or less affected. The breathing at this period is free and never in the least noisy or stertorous, unless the concussion is complicated with irritation occurring from lesion of the brain or its membranes, or of the *medulla oblongata*. The patient may remain in this state without any sensible alteration for several days, or he may, which is more commonly the case when restoration to health is to follow, recover his speech as well as his general sensibility; nevertheless he frequently speaks more or less incoherently, mutters to himself as if thinking of something, and wanders at night, becoming even delirious, and requiring restraint to keep him in bed. Inflammation of the brain is now fully established and must be subdued. It is at or about this period that other symptoms occur, which are frequently enumerated as those indicative of concussion,—it should be added, of concussion in its latter stage. The pulse becomes quicker, perhaps full or hard, varying from 84 to 90, and even to a hundred; and Sir Astley Cooper considered its rapid increase, on the patient being raised, as a certain sign of inflammation following concussion. ‘In such cases,’ he says, ‘an augmented pulsation of the carotids may be often observed, and is considered by some to be confirmative of the fact of concussion. Such a person will not be comatose but watchful, sleeps little or none, talks incoherently, or is often really delirious, refuses food if offered, drinks with avidity, has a hot skin and a white tongue. If other symptoms occur, such as spasms or convulsions, the absolute loss of any sense, or paralysis of any or the whole of a part, the case is complicated by laceration of the brain, compression, or other cause of mischief, from the effects of which, if he cannot be relieved by blood-letting, he gradually sinks into a state of coma and dies.’

“The following case will show that great pulsation of the carotid arteries is not a more certain symptom of concussion than of compression. W. Andrews, two years old, fell from the second story of a house on his head; he was taken up in a state of complete insensibility, with loss of voluntary motion, and could not be roused. When brought to the Westminster Hospital the skin was cold and clammy; the breathing stertorous, with convulsive action of the diaphragm and abdominal muscles; the right pupil much dilated, the left contracted. The pulse at the wrist could not be felt, although it was distinguishable at the heart, and the carotids pulsated strongly; he bled from the mouth and nose, the lower jaw being fractured; there were partial relaxation of the sphincters. Spasmodic twitchings and movements of the limbs supervened, and they

were forcibly drawn up from time to time as if by a great convulsive effort. He died in a few hours.

“The deviations which take place from the usual and ordinary modes of breathing, are supposed to offer distinctive signs of the nature of the injury which has taken place. They are, I fear, equally uncertain signs; they mark the degree of injury, and perhaps the part injured, rather than anything else. Stertorous breathing has always been considered a sign of extravasation causing compression of the brain. I have, however, seen many cases of slight extravasation with partial loss of power of one-half of the body, accompanied by great numbness, without any stertor in breathing; although I have never seen a well-marked case of large extravasation without it, or another peculiarity of breathing which is less thought of, although an equally characteristic and dangerous sign of such mischief having taken place when it is permanent; I allude to a peculiar whiff or puff from the corner of the mouth, as if the patient were smoking; and which, when observed among other urgent symptoms, is usually followed by death. Stertorous breathing and the whiff or puff at the corner of the mouth are presumed to indicate an injury to the cerebro-spinal axis as well as to the cerebrum; but whether the injury is direct or indirect is uncertain, although it is frequently accompanied by extravasation or laceration. When the breathing is only oppressed or laboured or heavy, neither extravasation nor lesion to any extent can in general be discovered after death. The surgeon will then practically be right in considering the stertor or whiff in breathing to be accompanied by, if not directly dependent on, extravasation or lesion; the heavy or laboured breathing to be dependent generally on a derangement of function, which is not perceptible on examination. If there be truth in experimental anatomy, stertorous breathing ought to be dependent on a direct affection of the *medulla oblongata*; nevertheless there can be no doubt that a temporary stertor or a puff at the corner of the mouth may exist without it, as a consequence of too great an abstraction of blood.”
—Pp. 11–18.

The occurrence of congestion and inflammation after concussion, at a period variable in different cases from the receipt of the injury, is the rule. Its absence is the exception. The surgeon, therefore, ought to watch carefully the first indications of returning pulse, heat, and other marks of reaction, and be prepared to control them promptly and decidedly by the employment of antiphlogistic measures. The only difficulty is to know the exact point at which to begin; and the knowledge of this can be acquired in no other mode than by observation and experience. Caution is also required in the first use of antiphlogistic measures; for though blood-letting may be requisite to control meningeal or cerebral inflammation, yet, if too much be drawn at first, bad consequences are liable to result. Mr Guthrie, therefore, recommends a moderate blood-letting at first, in order, as it were, to ascer-

tain its effects ; and afterwards that this evacuation be practised with greater freedom ; and often it requires to be several times repeated in order to extinguish effectually the meningeal and cerebral inflammation.

To show by contrast the injurious effects of too great blood-letting at too early a period, and proper detraction of blood at the proper time, Mr Guthrie relates the circumstance of two cases, in the first of which blood drawn only to sixteen ounces was followed by convulsive movements, ending in syncope, in which the breathing was performed *à la pipe*, or in the manner of the smoker, with the right side of the mouth, but recovery eventually followed ; and in the second of which, blood was drawn only to twelve ounces, with the most beneficial effect.

It is unsafe and difficult to compare any two or more cases in this manner ; but there can be no doubt that, to fix the time and the exact amount of venesection after severe concussion, is one of the most difficult tasks which the surgeon has to perform.

“ There is then a time, when the stage of depression is slowly passing into that of excitement, in which it may be doubtful what quantity of blood, if any, should be taken away ; but the loss of six, eight, or even of ten ounces can do no harm if they do no good, and their loss may enable the surgeon to form a more accurate judgment of the state or degree of the complaint than he could otherwise have done. When the period of excitement or of inflammation has begun, and the patient, although ‘ disposed to coma, but when roused is still irrational and impatient,’ he is not to be left to await the effects of a blistering plaster or a dose of physic, as has been recommended in such cases, but ought to be bled sitting up in bed to whatever extent may be necessary, to relieve the symptoms, or at least to cause a near approach to fainting, for nothing less can relieve such a person effectively, and give him a fair chance for life. The bleeding must be steadily repeated as the symptoms recur until relief is obtained, or until it becomes evident that the powers of the patient cannot resist the inroads of the disease and of the efforts made for its cure. The quantity of blood lost in two or three days is sometimes enormous in powerful healthy men, amounting to 100, 150, and even 200 ounces with the happiest effect.”—Pp. 21–22.

When concussion shows a tendency to terminate in mania, which it often does in those hereditarily or otherwise predisposed, Mr Guthrie thinks that the use of opium is the most likely remedy to prove beneficial. Whenever, indeed, the patient is irritable and restless, and does not sleep, the preparations of opium are most useful ; but it is only after previous due depletion that they show this property ; and their use must not be allowed to interfere with the functions of the intestinal tube. In the same state he notices the use of Dover’s powder, so warmly recommended by Bromfield after concussion.

It is rather singular, we think, that amidst all the remedies for

the treatment of the stage of collapse after concussion, and that in the incipient or congestive and irritative stage of inflammation, little or no notice is taken of the use of enemata. Their administration is, nevertheless, often most beneficial; and they are the only kind of remedial means which can be said to be not improper in the stage of collapse. At that time, when the pulse is feeble and small, or not perceptible, or intermittent, the surface cold and pale, and the only marks of vital action are the occasional and irregular action of respiration or convulsive gasping, the administration of an enema, containing two ounces of oil of turpentine is often followed by speedy reaction and partial restoration to sensibility. Such a remedy can never do harm; and it prepares the way afterwards, if need be, for moving the bowels where the patient cannot swallow.

Concussion, complicated with laceration and extravasation, naturally leads to the consideration of compression. This, says Mr Guthrie, means a diminution of the size of certain parts resulting from the pressure of an extraneous body, whether it be fluid or solid, in consequence of which particular symptoms are generally known to ensue. When they occur, it is said that the sufferer is labouring under symptoms of compression of the brain, and apoplexy from the rupture of a blood-vessel, he regards as the truest form of the complaint. The same symptoms, he allows, may proceed from the pressure of foreign bodies, or bodies which are foreign to the contents of the skull, as spiculæ and pieces of bone, which, if they do not compress, irritate the brain. He thinks, also, that many of the symptoms of compression occur from loss of blood, or the absence of pressure, or from insufficient pressure arising from changes in the circulation.

This view is a little inconsistent, and it appears to us at variance with the facts. Here we are virtually told that the same symptoms arise from compression, and from no compression, or insufficient pressure; that the same symptoms arise from the presence of too much blood and extravasation, and too little blood. In short, we regret to say that we do not see what is the object of the author, or what exact meaning he wishes to convey as to the nature and pathological state of compression of the brain.

It is no doubt true that symptoms very similar to those arising from compression proceed from loss of blood, and what is supposed to be insufficient pressure, or rather inadequate supply of blood to the brain. But we think that this by no means proves that the state of the brain is the same in these opposite states. As to the fancy maintained by some ingenious men, that the brain is incompressible, it is a metaphysical truth, but a pathological falsehood. Every one knows that, strictly speaking, all matter is incompressible, and that any given quantity of matter, however crushed, displaced,

forced together, or disorganized, is still the same quantity of matter. But to maintain that this matter is the same, or preserves the same arrangement of its intimate particles, after a quantity of blood has been effused upon its surface or into its interstices, and has more or less injured its structure, and rendered it unable to perform its functions, is contradicted by all anatomical, physiological, and pathological observation. It is, indeed, a beautiful, but absurd sophism, totally unworthy of the able men by whom it has been supported.

The further views of the author on the nature of compression may be understood from the following extracts.

“ If we take into consideration that we can often see the natural and ordinary size of the brain diminished under pressure, and that certain symptoms, such as insensibility, syncope, convulsions, paralysis, are consequent on this state, and are relieved by the removal of the pressure and the restoration of the compressed brain to its ordinary state, we may safely conclude that some derangement takes place in its integral parts, which may be best understood by the word Compression. If we further consider that compression can rarely exist without irritation, and that sometimes of a formidable nature, there does not appear to be so much difficulty in the subject as is frequently represented, although the physiological explanation may not be so simple. Sir C. Bell says, what is termed compression of the brain is a diminution of the vessels within the cranium, a diminution of the quantity of blood actually circulating, and the consequence a diminution of all the cerebral functions,—insensibility or profound sleep, an immovable and dilated pupil, the pulse labouring, the breathing heavy and stertorous ; nevertheless, if one vessel is emptied another must be irregularly filled, or the blood must be removed from the brain. In the present state of our knowledge, we apprehend that in many cases approaching to apoplexy, and in which the symptoms are similar to those arising from compression, all, or nearly all the vessels, as far as we can ascertain, are actually full of blood, instead of being partially empty and containing less than the natural quantity. When we see a patient, lying in a state of insensibility with a fracture of the cranium, immediately recover his senses after the application of the trephine and the removal of a large coagulum of blood, we are apt to conclude that the coagulum of blood and the insensibility stand in the relation to each other of cause and effect. It is not unreasonable to conclude that the pressure of the extravasated blood confined by the bone had occasioned the insensibility, and that this did not depend alone upon some few vessels containing less blood than usual ; for the brain, I apprehend, must be considered as a whole in all these investigations, and that reference may not be made to its vascular structures only, in explanation of the cause of its derangements.”—P. 40.

It is not easy, in all instances, to recognize the presence of compression, or to know what is the exact state of the brain, which gives rise to the symptoms ascribed to its presence. In many in-

stances, in which the symptoms regarded as those of compression have taken place, it has been found after death that no blood was effused to produce those symptoms. In other cases, also, in which palsy, apoplectic breathing, and slow or irregular pulse were supposed to depend upon effusion of blood or serous fluid, or the formation of purulent matter, neither blood nor purulent matter was found, and a quantity of serous fluid so small, that it is impossible to trace the connection between it and the symptoms occurring during life. Cases of this kind have led M. Serres and M. Gama, in imitation of Sir Charles Bell, to infer that the symptoms usually ascribed to compression arose not from that cause, but, in truth, from irritation. Without expressing a decided opinion on this point, the present author seems rather favourable to the same view.

Let us consider, however, a little more closely these same cases, and, above all, the nature of the brain and its vessels during the symptoms.

All of them are cases in which concussion has previously taken place. The effect of this is to be followed at the distance of different intervals in different individuals, and different circumstances, with symptoms of vascular reaction or congestion? Now, what is the process of vascular reaction or congestion? Is it not an undue or excessive accumulation of blood in the vessels, a morbid or preternatural congestion in them? in short, a larger quantity of blood in the vessels of the brain, or of some of its parts, than the sound state and healthy functions of the organ either requires or allows. It is of no moment what is the cause of this congestion; whether it be diminished or increased action. Most likely there is impaired and diminished action. But, at all events, anatomy shows us that this state of accumulation and congestion takes place in all organs after injury, and pathology teaches us that this is inflammation. Now, this vascular congestion or accumulation may compress, and we contend does compress, the structure of the brain as effectually as blood extravasated, or purulent matter effused and deposited in the surface, or in the substance of the brain. Nay, it does it more generally throughout the organ; for every little vessel is distended to its utmost capacity; the blood is struggling to pass through the overloaded capillaries to get into the veins, and it cannot; and hence every portion of cerebral matter through which these vessels are distributed, is crushed, compressed, and rendered quite incapable of performing its delicate functions.

This state, therefore, of the vessels, which, so far as they are concerned, is congestion and inflammation, is to the brain at once compression and irritation. It is of no avail to draw the line of distinction between them; for such a line does not in nature exist. The inflammatory congestion of the vessels is a cause of com-

pression to the cerebral substance, and, at the same time, of irritation, probably of the latter before the former, but as probably of irritation in certain parts, and of compression in others.

"By confounding," says M. Gama, "the experiments of Lapeyronie and others, the result of cerebral compression with the lesions of structure, which were caused in the organ exposed to observation, the evidence was sacrificed to the most arbitrary reasoning. Who can be persuaded that solid bodies introduced by force into the skull have no other effect but that of tightening the brain without tearing, bruising, or lacerating its substance? This organ, inspected afterwards, remained flattened at the place compressed. It was inflamed and even suppurated. From that time palsies, primitive or secondary, were the inevitable consequence of the lesion which the brain had suffered. Injections of liquids, on the contrary, pushed cautiously between the *dura mater* and the surface of the brain, while they respected the nervous texture, produced no phenomena of palsy. The results varied further, according as the contusing compression of the brain acted on large or small surfaces, or as it was directed from behind forwards, from before backwards, or from one side to the other."

"These remarks clinical observation fully justifies. It shows that these sudden and considerable depressions of the skull may occasion no disorder; that very large chronic effusions are often unknown for a long time during the life of the patients; that sometimes rapidly, sometimes slowly, the hemispheres of the brain, when left untouched, accommodate themselves in some degree to all the forms which they are obliged to take; and lastly, that death, which succeeds to large effusions of blood, is the result more commonly of the lesions of structure, of which they are themselves one of the effects."

"I saw at Strasbourg a woman, aged 73, who had for three years, on the right parietal bone, a depression as large as the hand, or rather a flattening of this region, which gave the head an irregular shape. According to the most correct reports, confirmed by this woman in my presence, she had experienced at the moment of the fall which caused it, no derangement in the action of the brain, and since then she had felt none. This depression might have diminished by one-tenth the entire volume of the brain. Cases of the same nature are recorded by other observers, and prove how little the brain is affected by a degree of compression which does not injure its structure, while the greatest contradictions prevail between the mechanical effects ascribed to effusions. Sometimes the latter are very considerable, while it is confessed that the patients have sustained very slight inconvenience; sometimes confined to the smallest quantities of fluid, authors fail not to specify in such circumstances the most violent symptoms; lastly,

in many cases it is affirmed that observers have before their eyes all the effects of palsy, which is regarded as the result of compression, and the alleged paralytic no sooner loses blood than all the symptoms of the supposed effusion are dissipated as if by enchantment.

Considered without complication with traumatic lesion, cerebral irritation is therefore the real cause of the palsies ascribed to collections formed within the brain, or at its surface. But we may be assured that muscular motion and sensation are never obliterated, so long as the blood remains entirely within its vessels, and merely oppresses the brain. From this state, indeed, may proceed an oppression of the nervous mass, a suspension more or less lengthened of the voluntary actions and the perceptions; but these phenomena disappear as soon as sufficient vascular depletion is accomplished, and the vessels recovering their freedom of motion can get rid of the blood by which they are overwhelmed. If the cerebral congestion is too long continued, or perpetually augmented by the accession of new influxes of blood, it is liable to ruptures and more serious extravasations, which may be remedied by the same means. *Encephalitis* is then threatening, or already declared; and the most unpleasant consequences of deep lesions of the brain may at this period be inevitable."

"The vessels of the cerebral membranes at the beginning of these congestions, or in their course, frequently partake in the congestion of those of the nervous substance, and all the parts united to the brain or situate at its circumference are in the same pathological relation. Probably these membranes are irritated in their turn; probably even they were at first under the influence of the cause which excited the sanguineous impulse in the organ. But it is certainly neither to this complication, nor to the distension of their vessels that the phenomena of stupor are owing; for if the brain were not then a centre of fluxion, it would endure, without inconvenience to the functions over which it presides, the mechanical effects of swelling of its covering membranes, exactly as it endures, in other circumstances, without being disturbed by them, the liquid layers which are diffused over its surface. This observation proves, then, that meningeal apoplexies are, in truth, only the result of a false prepossession, and that they cannot exist independent of congestion. The state to which this name is given differs from the others only in this circumstance, that the cerebral congestion, more excentric, has been directed towards the circumference of the organ, while, in the most ordinary cases, it is concentrated towards the centre. But cerebral irritation, it cannot be too often repeated, is the sole cause of all these accidents. All the sanguineous congestions are susceptible of the same explanations. Those which succeed wounds of the head constitute genuine apo-

plexies, which differ only in relation to the action of the external violence from which they proceed." *

Of the general correctness of the views now given it is impossible to entertain any doubt. To prove them erroneous, it would be requisite to obtain many cases of the secondary effects of violence inflicted on the head, in which the symptoms of palsy, stupor, and coma were always associated with effusion of blood or purulent matter. And it would be further requisite to prove, that in all cases in which the symptoms of palsy, unconsciousness, and coma went off after large depletion, as in Wiseman's noted case, where blood was allowed to flow much beyond what was intended or known,—blood had been actually effused, or purulent matter had been formed.

There is no doubt a great difficulty in this circumstance ;—that in many cases of injuries of the head where inflammation ensues, it has often advanced to softening or suppuration, or, at least, gone far towards these states, with few or no marked symptoms.

We must not, however, forget Mr Guthrie, who gives the following description of the symptoms, which he conceives to denote the presence of compression from extravasation of blood.

"When compression of the brain is caused by the extravasation of blood, the patient is senseless, breathes slowly, loudly, and in a heavy laboured manner, or with stertor, and cannot be awakened, although the noisy breathing may be for a time suspended. The breath is sometimes emitted from the corner of the mouth, like a whiff or puff of smoke, and with something of a similar noise, which, when permanent, is a more dangerous symptom than the common snoring or stertorous breathing. He sometimes froths at the mouth, and occasionally appears convulsed, but neither hears nor sees, nor takes the least notice of those about him. The countenance is generally flushed if the shock or blow has been slight, pale or livid if it should have been great. The pulse is usually slower than natural, sometimes irregular or intermitting, occasionally quick, even from the receipt of the injury. The pupils of the eyes may be contracted or dilated, being dependent for their condition more perhaps on the part of the brain affected than on the degree of injury. They are generally more contracted in the first instance than dilated ; they may afterwards pass into a medium or doubtful state ; one may be even dilated, and the other not. In general, as the mischief is continued and augmented, they become dilated and immovable. The eyes may be turned upwards, or may be fixed in the centre, or be drawn irregularly outwards or inwards, causing strabismus, which is, however, a more rare occurrence. If the eyelids should be partially open, tickling the cilia or the conjunctiva of the ball with a straw or a feather, will cause them to close if the spinal cord be sound. The mouth and lips are more or less compressed, and fluids run out

* *Traité des Plaies de Tête et de l'Encephalite, &c.* Par J. P. Gama, 2ieme edit. pp. 299, 303. Paris, 1835.

at the corners, unless placed on the very back of the tongue by a long narrow spoon, when they are swallowed with difficulty. Paralysis of one side of the face and hemiplegia are common, paraplegia is more rare. In both kinds of palsy, one part in one limb may be more completely affected than another, in which convulsive twitchings are sometimes present, as well as a frequent drawing up of the limb of the unaffected side. Tickling the soles of the feet or the palms of the hands will sometimes cause retraction of the toes or fingers, when the limbs are apparently motionless; pricking them gently with a pin will often give rise to convulsive startings and tremblings of all the muscles of the extremity when tickling fails, showing that the capability to move the part remains, although the will to do so is wanting. The leg or arm is sometimes drawn towards the body when separated from it; it more often falls from the hand as if it belonged to the body of a dead person; the muscles are occasionally more stiff and rigid, and some power of motion remains, although little of sensation; sometimes sensation is perfect when motion is lost, and sensation may be lost on one side and motion on the other. The urine, at first retained, may ultimately pass as well as the feces, involuntarily; nevertheless, irritating the verge of the anus will excite motion and contraction in the sphincter ani, if the functions of the spinal cord are not destroyed. The action of the involuntary muscles is little impaired in general, the secretions are but slightly affected; and when it is otherwise, the injury must have extended to the ganglionic system, and the whole of the nervous centres must be materially implicated."—Pp. 42, 43.

Then follows a discussion on the question as to the fact of the same or the opposite side of the person being affected with paralysis, when one side of the brain is injured, and which, as usual, leads to no definite results.

Regarding the treatment of all this class of cases, Mr Guthrie admits that the great object, in the first instance, is to subdue inflammatory action, until all the symptoms disappear. These consist in blood-letting, general and local, the application of cold lotions, the application of blisters, the use of cathartic medicine, and the employment of calomel and opium.

The question as to the use of the trephine in cases of injury, he seems to consider as not determined; and though he admits the great efficacy of antiphlogistic treatment soon after the injury, yet he thinks that, in certain cases, where no immediate symptoms of cerebral disorder or inflammation take place, they may cause their existence subsequently, and thus render operation necessary. Thus, a blow, not very severe, is inflicted on the skull, and does not immediately cause urgent symptoms. But in the course of four, five, or six months, or it may be twelve months after, pain being established almost constantly, the patient becomes paralytic or epileptic, and the pain persisting, he at length is attacked with coma,

and dies. Several cases of this kind are recorded by authors. In most of them the bone is found diseased, sometimes with the membranes, especially the *dura mater*, detached and covered with lymph or purulent matter. Other cases are related in which, by the use of the trephine, the surgeon cut out a piece of the skull, and the patient was delivered from all his torments. The operation, he thinks, is in such cases strongly recommended by the results.

"Dease trephined a young man nine months after he had received a blow on the upper part of the *os frontis*, which caused him great pain in the head, rendering him in general incoherent in his speech, and infirm in his limbs. The wound was not quite cicatrized. On examination, Dease found a depressed fracture larger than the breadth of a sixpence, which he removed with a large crown of a trephine. The three subsequent days he extracted ten pieces of the inner table, which had been driven into the brain. The man left the hospital in about three months in perfect health.

"Sir A. Cooper, in his Lectures by Mr Tyrrell, notices the case of a gentleman who suffered from epileptic fits after a blow on the superior part of the frontal bone, and was cured by the trephine twelve months after the accident; and another from Mr Cline, of a sailor who had a depressed portion of bone near the superior edge of the left parietal bone, and had lived for a year unconscious of his existence; being in a great degree destitute of sensation and voluntary motion, and having lost his memory and speech. Mr Cline removed the depressed portion of bone, after which the man gradually recovered, and was discharged from the hospital cured in two months.

"During the siege of Badajos, Colonel F. applied to me on account of a pain he felt in his head on the slightest effort of any kind, which had followed a wound on the posterior part of the parietal bone. It was so distressing to him, that he willingly agreed to submit to the trephine with the hope of obtaining a cure at the end of the campaign, but another wound at the battle of Vittoria in nearly the same place killed him."—Pp. 81, 82.

The nature of the mischief found in the cranium is illustrated by the following statement.

"I have in my possession a frontal bone, and a portion of a parietal bone, in both of which there is a sufficient projection of the inside of these bones to have caused a pressure on the brain, which might have given rise to any of the symptoms alluded to, and which would have been removed by one application of the trephine, provided the spot where the mischief existed could have been ascertained."—P. 84.

In the following case we have an example of this practice terminating favourably.

"M. A. Farnham, aged 23, a stout healthy-looking girl, received a blow, two years ago, from a stone falling from a door-way under which she was passing, which struck her upon the left side of

the head at a spot an inch anterior to the parietal prominence, the weight of the stone, and the space through which it fell, making the estimated force with which it struck the head equal to sixteen pounds. The immediate effect of the blow was insensibility, followed by acute fixed pain in the head, which has ever since continued to mark the seat of injury. A week after the receipt of the blow she began to lose the power of moving of the right arm, there being, however, no loss of sensation or any disturbance of the cerebral functions.

“ During the following twelve months her symptoms remained unchanged, and this period was spent in Guy's, St Thomas's, Westminster, and St George's Hospitals ; but having derived no relief whilst in any of these institutions, she became an out-patient under the care of Dr Roe.

“ After the lapse of a few weeks the paralysis of the arm suddenly increased, sensation still being unaffected, and she experienced no further change in her condition until after eleven months, when she was again admitted into the hospital, her symptoms then being the following ; the arm and leg of the right side quite paralytic, the former, which had previously been flaccid, having now become remarkably rigid, and its temperature being below that of the opposite side ; vision, particularly that of the left eye, imperfect, the pupils, however, acting naturally ; hearing on that side also affected ; memory bad ; respiration frequently slow and almost stertorous ; the countenance assumed a dull heavy expression, and she manifested an unusual tendency to sleep. All the ordinary remedies having failed to relieve these symptoms, Mr Guthrie was requested to see her, and the operation of trephining was eventually agreed upon.

“ April 1st, 1841.—Mr Guthrie this day removed a disc of bone from the exact point in the parietal region to which she referred the pain. The portion of bone presented no evidence of disease ; its thickness varied from two and a-half to four lines, the latter measurement corresponding to the part most distant from the sagittal suture ; the vessels of the diploe bled freely, the *dura mater* was quite healthy, and without any very evident motion.

“ On visiting her an hour after the operation, she raised the previously paralytic arm several inches from the bed, and was able to bend and extend the fingers. The pain in the head was considerably less, and her countenance, before dull and heavy, was now remarkably animated. Sensation had returned in the arm, and partially in the leg. Her pulse was calm and skin cool.

“ Ten hours after the operation she was attacked with rigors, followed by pyrexia and all the symptoms of commencing inflammation of the brain. By the immediate abstraction of blood, which was three times repeated during the succeeding twelve hours whenever the pain in the head or the force of the circulation increased, every bad symptom was removed. In the course of three days the paralysis had completely disappeared, sight and hearing again became perfect, and after passing through a speedy convalescence, she quitted the hospital completely recovered.”

"She has since had some relapses of pain, and uneasiness in the head, but is altogether a different person, although of a very hysterical temperament. The cicatrix on the head is firm, and she considers herself to have been cured by the operation, although I find it difficult to say in what manner it was effected, or why the removal of the bone, which was in a perfectly natural state, should have given relief."—Pp. 84—85.

The external effects of injuries, blows, and contusions of the scalp and skull are in some instances extremely alarming. Mr Pott believed and maintained, that, when the periosteum was detached by injury or inflammation, the *dura mater* beneath the bone was also detached from the inner lobe, and that, in consequence of this, the cranium became dead or carious at the part. It must, nevertheless, have happened often to others, as it has done to ourselves, to observe that the pericranium is either detached by violence, or by inflammation; and yet, under proper management, the patient recovers perfectly without having presented any symptoms of affection of the membranes or subjacent bone.

Much, we believe, depends on the age of the subject. In the young, a wound or injury of the scalp or skull, which in the aged might produce concussion or external fracture, is followed by inflammation in the pericranium and subjacent bone, which is ulcerated away, and a hole is formed, exposing the brain and membranes, and threatening inflammation there. Yet all this mischief is stopped by blood-letting, active purging, and above all, the application of cold to the wound of the head. The external inflammation is subdued; the discharge is stopped; the aperture in the skull is filled by bony deposit; and the patient makes a complete recovery without any bad symptom.

The same degree of injury in an adult would have been attended probably with sloughing, detachment of the pericranium, and suppuration and detachment of the subjacent *dura mater*.

The same injuries produce phlegmonous inflammation of the scalp, often with caries of the bones, or death of the external table, diffuse inflammation, and erysipelas of the scalp, with much constitutional disorder and threatened affection of the brain. In the first and second cases, the great object is to remove tension by incision, and evacuate matter if formed, if not, to abate the inflammation. In the third case, even Mr Guthrie recommends also the incision, though we have seen cases do quite well without it.

Mr Guthrie is rather more partial than most surgeons of the present day to the use of the trephine in some of those severe injuries. He thinks its employment is mostly indicated in the case of adults, and especially, where from gun-shot wounds, the skull is fractured and depressed. He observes, *first*, that the skull of the young subject is yielding, and less likely to be severely fractured; and when it is depressed, either the depression is

not followed by bad symptoms, or under depletion these symptoms readily disappear, and the bone, though beaten in considerably, may eventually rise to its usual level, or nearly so. (P. 102—110.) In the second place, he argues that the brain also, being softer and less consistent, can accommodate itself more readily, and with less damage to its functions to any temporary pressure. He maintains further, that, if the records of surgery be examined, most of the successful cases of recovery from depression or from fracture with depression, and the skull in which the operation was not performed, occurred in young persons probably under twenty years of age.

In the third place, he tells us it is very different in the adult, in whom the skull is not only harder and thicker, but much more brittle, is fractured by forces which would merely bend or dint the cranium, in the young subject, and, at all events, when fractured, it shows no disposition to rise after depression. In the young subject, on the contrary, it does occasionally rise after depression. He is hence disposed to refrain from the use of the trephine in persons under sixteen years of age; but recommends its use when the symptoms of depression are evident in adults, after due and proper depletion.

“ In a child or young person the symptoms of compression or irritation, when they appear even at a secondary period, may pass away under moderate depletion; but in an adult any undue delay in giving the necessary relief by the removal of the depressed portion of bone, will in general be destructive to the patient. It is the irritation caused by the depressed bone on the *dura mater*, and communicated to the brain, which gives rise to the unfavourable symptoms, and to the formation of matter which follows them.

“ A gentleman received a blow on the side of the head, which knocked him down and deprived him of his senses, from which state he partially recovered, and vomited; some stupefaction, however, remained, although he could be made to answer by a little importunity. Pulse 62, irregular, breathing slow, the pupils contracting under the influence of light; the integuments where the blow was received were soft and swollen, in all probability from an extravasation of blood beneath. The next day the pulse was full and regular, the pupils were dilated, vomiting had taken place several times, and the patient answered correctly on being sharply questioned. He was now bled largely, purgatives were administered, and cold was steadily applied to the head. He was bled the next day, and on the third the left arm became paralytic, the pupils continued dilated, and on the fifth day paralysis implicated the left leg as well as the arm. There could now be no doubt that the brain was suffering from compression, but as the nerves of the excito-motory system were unaffected, and the functions of ingestion and egestion were satisfactorily accomplished, it was thought advisable to trust to the efforts of nature. The swelling of the scalp was painful.

“ A week afterwards the general symptoms were the same, or

only slightly augmented by fever ; but as the swelling of the scalp was more painful, it was opened, and a quantity of matter was evacuated, the bone beneath being fractured and depressed. As this operation gave some relief, it was thought advisable to wait, with the hope that the benefit thus obtained might prove permanent. The patient did not, however, improve ; and as the symptoms of fever increased, and were accompanied at last by rigors and great pain in the head, the depressed portions of bone were removed, and about half-an ounce of purulent matter escaped from between the *dura mater* and the bone. The relief given this time was effective, and the patient perfectly recovered. ‘*La chirurgie expectante*’ placed this man’s life in the greatest jeopardy. It was only saved at the last moment by the aid of that surgery which ought not to have been withheld when the paralysis, by affecting the leg as well as the arm, demonstrated the extension of the mischief within the head. In this instance the operation was successful, but it is not in general so serviceable when delayed to so late a period. It is in cases of this nature often a means rather of prevention than of cure.” —Pp. 118–119.

Matter may be contained beneath the *dura mater*, and of course, when this is known the operation becomes necessary.

“ I have seen, on the removal of a portion of bone by the trephine, the *dura mater* rapidly rise up into the opening, so as to attain nearly the level of the surface of the skull, totally devoid, however, of that pulsatory motion which usually marks its healthy state ; and an opening into it, under these circumstances, has allowed a quantity of purulent matter to escape, proving that the unnatural elevation of the *dura mater* was caused by the resiliency of the brain when the opposing pressure of the cranium was removed. I consider this tense elevation and the absence of pulsation to be positive signs of there being a fluid beneath, requiring an incision into the *dura mater* for its evacuation. It is a point scarcely, if at all noticed in English surgery, although much insisted upon in France. It was not in the slightest degree understood at the commencement of the war in the Peninsula, and was one of those points which particularly attracted my attention.” —Pp. 125–126.

There are many wounds, nevertheless, of the skull, from balls and other foreign bodies driven into the brain, in which the patient is past all surgery ; in whom the trephine adds only to the mischief ; and consequently, in which the patient must be left to his fate. In such cases Mr Guthrie recommends that nothing should be done.

Where these injuries are treated in the best manner, often the intellects and moral constitution of the individual are deranged for days, or at least a long time. Paralytic affections, epileptic fits, loss of memory, fatuity, extreme irascibility, all follow such injuries, and remain a longer or shorter time, sometimes for life. In

other instances, where the first symptoms were very alarming, by some favourable change, with proper treatment, recovery has been very perfect. The following is a case of interest in this way.

“ Mr Keate has favoured me with the following case :—A gentleman received a severe blow on the right side of the head from a loaded stick, which stunned and knocked him down. He partially recovered from this, walked with support to the sea-shore, and was taken on board his yacht. He soon became again insensible, and remained so for nearly three days. Whilst thus deprived apparently of sense and motion, and supposed to be dying, he distinctly remembers hearing a discussion between a relation and the sailing master, whether they should buy a coffin for him at the port where they were anchored, or take him to England as he lay in his cot ; and he was conscious of his utter inability to make any movement indicating that he was alive and understood this conversation. After four days an incision was made through the temporal muscle down to the bone which was not fractured. He soon afterwards became delirious, and remained so more or less for a fortnight, when he suddenly recovered his senses. He was bled once during this time from the arm. About a month after the accident he came to London ; the right side of the head and face was much thickened and enlarged, and hard to the touch, particularly over the temporal muscle. He cannot articulate distinctly, nor command his words so as to describe his case, nor his present feelings. Both pupils are much dilated, and the iris is hardly sensible of the stimulus of light. He cannot see to read nor to write, letters being mistaken and confused : has had no headache that he recollects, but was troubled by occasional sickness for the first few days, and feels himself gradually getting better. Pulse 72 ; tongue moist and clear. Perfect quietude was enjoined, and calomel and opium were administered in the dose of two grains of calomel three times a-day, and the quantity was gradually increased between the 16th of September and the 16th of October, when it was omitted, the patient being much better, although the mouth was not made sore. Blisters were applied to the neck and to the forehead, the head was shaved and slightly irritated ; and sarsaparilla and iodine were given until the beginning of December, when he was free from complaint, and has remained so unto the present time.”—P. 150.

It is not easy to say what was the exact state of the brain after this injury ; but most probably it was that of inflammatory congestion of the membranes and brain beneath the part struck, or in the line of it. The case is important in showing how much may be done without operation.

We have already mentioned the frequency of trepanning during the sixteenth, seventeenth, and eighteenth centuries, and the great change which has taken place in the restricted use of this operation. All this, we think, is creditable to surgeons and to surgery ; and it is probable that many cases in which it is still employed, would recover without its use. But, at all events, one great object

is gained, that it is now rarely attempted, unless under circumstances of absolute necessity; and when it is performed, it is not deemed necessary to cut out large portions of the skull and leave the patient to nature. Mr Guthrie gives the following case as one in which the largest trepanning in the present day has been performed.

“A young labourer in a coal-mine was struck by an iron chain, which had fallen on him from a height of nearly 200 feet. There was no external wound, but considerable tumefaction of the scalp; and as some hours afterwards he was labouring under symptoms of compression of the brain, it was deemed advisable to divide the scalp, to ascertain the state of parts underneath. This being done, the left parietal bone was found to be extensively fractured at its most protuberant part; two fissures extending nearly the length of the bone, joined by two others, inclosed an irregularly-shaped portion of bone, of about half an inch broad at its anterior, and an inch or more in breadth at its posterior margin; the inferior angle of this piece was considerably depressed. On applying the crown of a trephine, for the purpose of gaining room to raise the depression, it was discovered that the internal table was so much more extensively fractured than the external, that it required twelve applications of the instrument, and the consequent removal of a very considerable portion of the bone, before the broken edge of the internal table could be got at, or its extent ascertained. When this was at length effected, and an attempt made to elevate the fracture, the entire piece became detached, and was removed. The *dura mater*, thus exposed, was found distended by a quantity of blood extravasated underneath it. No abatement of the symptoms being perceived to follow the elevation of the bone, it was decided to endeavour to evacuate the blood by an incision through the membrane. This was accordingly made with a very sharp lancet, to the extent of about three-quarters of an inch. Some blood flowed out, the symptoms of compression were immediately relieved, and shortly disappeared. The edges of the scalp were brought together over the wound, lightly retained *in situ*, and the wound covered with lint. Nothing unfavourable afterwards occurred, and the man got well.”—P. 153.

This treatise, it will be seen, contains a great deal of curious and instructive matter, not always arranged in the best and most methodical order. The author, we think, too partial to operations. But the book is valuable, as containing much that is the result of long practical experience.

ART. IV.—*A Treatise on the Principles and Practice of Homeopathy.* By FRANCIS BLACK, M. D. London, Edinburgh, and Dublin, 1842. 8vo. pp. 239.

THE chief lesson that is taught by the present volume is, that

the author entertains a most exalted opinion of himself and his homoeopathic brethren, and the practice of homoeopathy, and a very thorough contempt for all other sorts of physicians, and their methods of practice.

In an old-fashioned but rather valuable book, it is said, "Let nothing be done through strife or vain-glory; but in lowliness of mind, let each esteem other better than themselves." This maxim the homoeopathists reverse; and not only do they propagate their peculiar doctrines through strife and vain-glory, but in doing so they fail not to say, we are better, more skilful, wiser, and more deserving of the respect and esteem of mankind, than all other physicians of all other sects taken together.

The allopathic physicians are told by the homoeopathists, that their pathology and nosology is naught; that their materia medica arrangements are confused; the system defective and injurious, (8); and their practice most pernicious and deadly. Dr Maunsell is quoted for saying that practitioners who follow the treatment recommended by Dr Armstrong, in scarlet fever, should at least peruse the sixth commandment. There are many practitioners who would be all the better, not only for the perusal of the sixth commandment, but also for having impressed practically on their minds the moral responsibility therein enjoined. And it should be remembered, that it is quite as possible to break this commandment by omission and neglect as by commission and activity. We scarcely know any class or order of practitioners who have more need to have this commandment constantly before their eyes than the gentlemen of the homoeopathic school; and if, as to scarlet fever, they ask the reason, we would refer them to two very good authorities in this Journal, viz. Mr Sandwith of Bridlington and Mr Dewar of Dunfermline. But this is not the only disease in which a remembrance of the moral obligation of the sixth commandment presses with peculiar force on the homoeopathic physicians. A long list of diseases of daily occurrence may be mentioned, in the management of which they have every prospect of breaking that valuable statute.

In former volumes of this Journal, (xxviii. 61, by Mr Spry, and xxxviii. 355), we gave a pretty full view of the general doctrines of homoeopathy, without expressing either praise or censure of the system. To this we refer our readers for an exposition of the leading principles of the system, as it would be very idle again to do anything of the kind. The whole system, indeed, when narrowly examined, abounds so much in limited and partial views, in statements which it is quite impossible to believe, and in pathological principles so unstable and erroneous, that we cannot imagine how any man of judgment or observation can place any confidence in it. Declamation for argument, fanciful assumptions for facts, new and very remote analogies, seem to be all that the ho-

moeopathist has to offer in return for the confidence which he desires the public to repose in his doctrines.

Against such a system it would be quite idle to adduce any serious arguments. For instance, Hahnemann, we are told, "considers every disease which does not belong to surgery, as being a purely dynamic and peculiar change of the vital powers in regard to the manner in which they accomplish sensation and action." At this rate every disease that tends to disorganization or morbid products is included, and every organic disease is excluded. If, then, all diseases of the latter description are excluded from treatment, the duty of the physician becomes very light. He scarcely requires to study disease or its effects; and he may shut his eyes upon all the most serious and alarming distempers of the human frame.

Let, however, the consistency of the author be observed in this matter. "It therefore follows," he concludes, "that the homoeopathic medicinal agent, selected by a skilful physician, will convert it into another medicinal disease, which is analogous, but rather more intense. By this means the natural morbid power, which had previously existed, and which was nothing more than a dynamic power without substance, terminated, while the medicinal disease, which usurps its place, being of such a nature as to be easily subdued by the vital powers, is likewise extinguished in its turn, leaving in its primitive state of integrity and health the essence or substance which animates and preserves the body."

Now, any person of common sense would at once ask, why convert this dynamic change in the vital powers into another medicinal disease more intense? Is this curing disease? If it be merely a dynamic change, any one who knows the nature of the functions and properties of the human body, knows also that it will subside of its own accord. To convert it into a more intense disease, therefore, by medicinal means, is a piece of gratuitous folly as well as cruelty. But again, we are told that the medicinal or artificially produced disease is such as to be easily subdued by the vital powers. There is, therefore, a dynamic change in the vital powers as one disease, and there is excited a more intense medicinal or artificial disease; and as the latter is easily subdued by the vital powers, is it not to be inferred that the former, being less intense, would be more easily subdued by the same vital powers; in other words, by being let alone? It is not easy to discover whether Dr Black adopts the views of Hahnemann, or not. It is clear that there is a division in the camp of homoeopathy; for presently after we find, Dr Curie, one of the apostles of the system in London, treated with very little ceremony, as the advocate of a different mode of explaining the operations of remedies upon homoeopathic principles, which is stigmatized as erroneous; and in no long time similar treatment is awarded to an explanation by

the late Dr Fletcher, which is characterised as imperfect. The conclusion at which the homoeopathist arrives is one which shows at once the modest appreciation of its merits and its highly philosophical character.

“The homoeopathic principle widely differs from many dogmas of the allopathic school, in that it was *discovered* not *invented*—discovered in conformity to that fundamental principle—that the basis of all our knowledge is the accurate observation of actual phenomena; and the correct generalization of those phenomena should be the sole foundation of all our reasoning.”—P. 56.

Was it a discovery made in this manner when Hahnemann asserted, in opposition to the general testimony of all other observers, that cinchona induced symptoms analogous to intermittent fever? Was it a discovery made in this manner, when it was gravely maintained that Pulsatilla causes darting sensations in the pit of the stomach, giddiness and flatulent eructations; symptoms which proceed, it is known, from very different causes. Was it a discovery made in this manner, when Dr Hahnemann announced the unheard of proposition as an established principle in pathology, that all chronic disorders proceeded from the operation of one or other of three morbid poisons, the syphilitic, the poison of itch, or that of sycosis. And here, be it remarked, it is the first time that the phenomena of sycosis were ever ascribed to the presence of a peculiar morbid poison. We are not certain that any one regards it as contagious. But whether it be or not we should be glad to hear specified the diseases supposed to proceed from this new source. Dr Black has given at p. 118 a sort of description of this supposed malady, but so totally different from what we have either seen or heard of as seen by others, that it will be quite impossible to recognize in the description anything like the *Sycosis* of Willan and Bateman. He appears, indeed, to have mistaken the *fici* found at the raphe and anus in many patients for this disorder, and thereby to have rather absurdly applied to it the term *Sycosis*. These *fici* and *condylomata*, every experienced physician knows to be the result of gonorrhœa neglected and aggravated by gross uncleanness. But we never heard that they or their cause gave rise to chronic distempers in general.

The homoeopathic physicians have endeavoured to be both witty and severe upon the mortality which, according to them, takes place under the allopathic and enantiopathic system of practice. Let them, however, beware about using this argument too confidently; for we can tell them that the explanation, when it comes, will not much benefit their practice, that is the commercial and pecuniary part of their practice. Wherever, indeed, any man, or body of men begin to talk about the mortality of particular methods of treatment, they should speak with much deliberation and caution; and in many cases silence would be more judicious. It

is well known that, at least since the fall, the doom of mankind is death ; and that since the time of Moses the duration of life was rarely extended beyond threescore and ten years. Since that time it is ascertained that the average duration of human life is not beyond forty years, (De Quetelet says thirty-three years, others say thirty-five) ; and immense numbers pay the debt of nature long before that age. It is clear that the human race must die of diseases, for almost no one dies of old age, properly so called ; and even in old age peculiar diseases carry off the race of man. Do the homoeopaths really say that they have it in their power to reverse the original doom ? Do they even maintain that they can lengthen the average duration of human life ? If they do, there is an end to all reasoning or observation on the subject ; for from an answer in the negative no conclusion can be drawn, except that of the gross ignorance, and the matchless assurance of those who maintain that they possess such powers.

We never had a high opinion of the knowledge of the homoeopaths ; but we were willing to give them credit for being sincere ; and to believe that while they maintained the superior advantages of homoeopathic treatment over the allopathic, it was chiefly because they were not aware of the fatal tendency of several disorders, under even the most judicious treatment ; and because, where they were aware of this, they declined treating such diseases, as they did not think them amenable to treatment. When they pursue this line of conduct, however, candour and justice require that they should refrain from expressing any opinion of others, who honestly and industriously endeavour to understand the nature of these diseases, and to know what remedial measures can counteract their effects. Common decency ought to suggest to them the impropriety of saying one word regarding the mortality in the practice of other physicians.

It is, however, exceedingly idle to bestow anything like serious attention on the dreams and fancies of these harmless enthusiasts. A greater amount of unfounded statements, wild fancies, and solemn trifling, combined with gross ignorance, and occasional misrepresentation, it is impossible to find in any single volume than in the present. This we say not in the spirit of levity or ridicule, as the author asserts, those his opponents do, who are not incensed at him. There is such a lack even of wit or humour that it is quite impossible to smile at such statements ; and nothing occurs to enliven the dulness and pompous tediousness which extends through 200 pages of letter-press.

Nor has the present performance the merit of novelty. At p. 143, we are treated with two examples of the mode of clinical observation and reasoning pursued by the homoeopaths, and the mode in which they establish their therapeutic indications. These two examples are not new. They were given in this Journal, first shortly by Mr Spry in his exposition in 1827, and afterwards in

1832, in order to avoid all cavil as to misstatement, as fully as they were given by Dr Hahnemann himself. In this interval the homoeopathists ought to have treated us not only with something new, but with something of their own, and not given us the *crambe recocta* of their venerable preceptor. Yet here, after the lapse of from twelve to sixteen years, appear the same stale, flat, unprofitable matter; the same solemn trifling; and the same miserable mummary. Really, if the homoeopathists cannot give us something new, something at least with the air of novelty, instead of wearying us with the same tedious stories of dyspeptic nervous laundresses, and hypochondriacal clerks, with all the nauseous nonsense about their flatulent eructations, their stomach-aches, and all the miserable and endless complaints to which such persons pay such serious attention, they ought to refrain from writing or publishing at all.

From the present specimen, indeed, of didactic exposition and reasoning, we are satisfied that the strength of the homoeopathists lies not in writing or in reasoning. So long as they talk and boast of the superiority of their system, so long as they can declaim against all who are supposed to be hostile to the system, we can imagine they will gain numerous proselytes among weak and ill-informed men, and ladies, more ready to listen to overdrawn and exaggerated statements, bold pretensions, and lavish and liberal promises, than to weigh evidence or examine the force of conflicting testimony. But to write and place their views and doctrines before the public is evidently a task not suited to their capacity.

In the concluding chapter, the author examines the arguments adduced against the system of homoeopathy, and takes a view of various published statements detracting from the glory of the practice. The chapter contains nothing demanding serious attention. Various inconsistent admissions are made, both in that and the previous chapter. All sorts of hard names are applied, and several not very good motives ascribed, to the foes of homoeopathy. This example we cannot dare to imitate. To the force of well-established facts and sound arguments, we avow ourselves at all times and in all places to be open and susceptible of being convinced. But of this, we regret to say, we see nothing in the present work.

The author shows no great accuracy in writing the names of various articles, persons, and places, with which his system must have rendered him more or less familiar. Thus we find for *Cinnabaris*, *Cinnaberis*; for *Stramonium*, *Strammonium*; for *Antipsoric*, *Antipsonic*, and several other unseemly errors. Det-harding is made Delharding; Basil Valentine, we are told, is the author of a work de Microsmo; and Torgau becomes Torgo, with many other oddities of a similiar nature.

PART III.

MEDICAL INTELLIGENCE.

ANATOMY AND PHYSIOLOGY.

On the Decussation of the Fibres at the Base of the Brain. By M. FOVILLE. (*Bulletin de l'Académie Royale de Médecine*, August 1842.)—After pointing out that the extent of the decussation of the fibres of the brain between the *corpora pyramidalia*, as hitherto described, is not sufficient to account for the completeness of the paralysis of one side of the body when the opposite side of the brain is injured, M. Foville describes his own researches. He has succeeded in demonstrating that there exists a decussation of fibres at the commencement of the spinal cord, not through the extent of a few lines only, or by a small number of filaments, but through the whole distance which separates the basis of the *crura cerebri* from the *medulla spinalis*, properly so called.

The anterior columns of the cord when arrived at the *medulla oblongata*, separate from the median line to give place to the *corpora pyramidalia*, and at the level of the tuber ascend and pass at right angles over the uppermost of its arcs. The posterior columns, on the other hand, pass outwards from the apex of the columns going to the *crura cerebelli*, and leave exposed the anterior fasciculi, which are then visible behind, through the whole length of the floor of the fourth ventricle, and along the *aquæeductus Sylvii* to the infundibulum.

The *crura cerebri*, on the other hand, form, from above downwards, a section of a cone, the fibres of which, instead of taking a straight direction, are turned spirally, and successively approach the median fissure into which they penetrate, and plunge into the inner part of the anterior fasciculi of the *medulla spinalis*. The fibres from the right crus thus pass into the prolongation of the left anterior fasciculus, and *vice versa*. Along their course the crura constantly giving off fibres, which thus pass from one side to the other, gradually grow thinner, and at their exit from the tuber they constitute only the base of the anterior pyramids. The same process going on they become finer and finer, till their very apices decussate at the boundary between the *medulla spinalis* and *medulla oblongata*. The transference of all the fibres of the *crura cerebri* from one side to the other of the nervous axis is thus complete.

The best mode of demonstrating this arrangement is to separate the two lateral portions of the nervous axis from the apex of the calamus to the infundibulum, by separating the edges of the median groove. When this is done gently, each half may be seen to furnish an infinity of fibrous fasciculi of various sizes, which pass across and interlace with each other.

On the Development of Bones. By M. FLOURENS. (*Comptes Rendus des Seances de l'Académie des Sciences*, 7th November 1842.)—M. Flourens states that two forces are in operation in the formation of bone, the

one that of the external periosteum, the other that of the medullary membrane or internal periosteum. In a state of health each of these maintains its proper limits, the external periosteum produces or repairs without ceasing the surface of the bone externally, while the medullary membrane absorbs the internal layers as they become useless from being covered with new layers. When one or other of these periosteums was destroyed, the other which was left produced the new bone. If the internal periosteum or medullary membrane was destroyed the bone died, and the new bone was formed outside the old bone. When the outer periosteum was destroyed the bone also died, but the new bone was produced from the medullary membrane, and of course within the old bone.

Experiments were made in imitation of those of Duhamel, by passing a silver wire around the tibia of a young pigeon, when after a time this wire was found within the medullary canal. His experiments with wires confirmed those he had already arrived at by the administration of madder, viz. that bones increase in thickness, in consequence of successive superimposed layers. Their increase in length by terminal added layers, which he had formerly proved by means of madder, he also in this memoir proved by adopting Duhamel's and Hunter's experiment; piercing two holes at ascertained distances in the shaft of the bone, and finding that, though this bone had greatly increased in length, the distance between the holes remained the same. Lastly, experiments made by passing a platina wire round the periosteum itself proved that it is formed by additions of superimposed layers on its outer surface; so that ossification consists in the regular and successive transformations of these layers of periosteum into cartilage, and these again into bone.

On Menstruation. By M. RACIBORSKI. (*Bulletin de l'Academie Royale de Medecine*, January 1843.)—M. Raciborski in a letter to the Academy, details the results of his researches on menstruation, of which the following are the most important.

1. There exists the most intimate connection between the Graafian vesicles and menstruation. When these vesicles arrive at their full development menstruation commences, and when they are destroyed menstruation ceases.

2. At each menstrual period a follicle projects like a nipple on the surface of the ovary, where it afterwards bursts, without requiring for that purpose an erotic excitation.

3. The rupture of the follicles in general appears to take place just at the period when the menstrual discharge is stopping.

4. The ovaries do not act alternately, as has been affirmed; they do not seem to be under any fixed law as to this.

Chemical Theory of Nutrition. By MM. DUMAS and CAHOURS. (*Comptes Rendus des Seances de l'Academie des Sciences*, 28th November 1842.)—For a considerable period chemists have noticed in animals the existence of three neutral azotized principles, remarkable, either on account of the number of properties which are common to all, or on account of their abundance in the fluids or solids of the animal economy, or by their presence in all the essential ingredients of our food. These matters are albumen, fibrin, and casein. The albumen existing in the white of the egg, the fibrin forming the coagulable portion of the blood, the casein constituting the animal part of milk. In a physiologico-chemical essay, read to the Academy of Sciences about eighteen months ago, by MM. Boussingault and Dumas, it was endeavoured to be proved that albumen, casein, and fibrin existed in plants; that these matters passed ready formed into the bodies of the herbivorous animals, from whence they were transferred into those of the carnivore; that plants alone possess the power of forming these three

products, which animals separate either for the purpose of assimilating to their own bodies, or to destroy them, according as the wants of their system demand. MM. Dumas and Cahours, in the present memoir, have extended these principles to the formation of the fatty matters, which, they state, take their origin in plants, but in animals undergo a species of combustion, or remain as transitory parts of the body. They have also urged the necessity of grouping together all the organic bodies which possess the property of passing into the state of lactic acid during fermentation, and which, as sugar and starch, form an essential ingredient in the food of man and the lower animals, and are only produced in plants by the powers of vegetation.

The details of these views, and the conclusions drawn from them, may be thus shortly stated.

The vegetable kingdom produces or forms the neutral azotized principles, the fatty matters, sugar, starch, and gum; the animal kingdom, on the other hand, consumes these. The first decomposes the carbonic acid, water, and ammoniacal salts formed by the second; which in its turn absorbs oxygen for the disengagement of these. The animal produces or gives out heat and electricity; the vegetable, on the other hand, absorbs them. The vegetable is a decomposing apparatus which forms new products, and is fixed in one spot; the animal is an oxidizing apparatus, endowed with locomotive powers.

"If, as we hope," continues MM. Dumas and Cahours, "physiologists recognize with us that plants are destined to create albumen, fibrin, casein, but that animals only modify these matters, assimilate them, or destroy them, but cannot create them, we shall esteem ourselves happy, after having been the first to publish such opinions, to be also the first to furnish to science the rigorous analysis of these substances, so often studied for some years past. To avoid confusion, however, it ought to be stated, that, in so far as albumen is concerned, this opinion was previously announced by MM. Prevost and Le Royer, in their Memoir on Digestion; but it ought also to be stated that they did not adduce sufficient proofs to convince physiologists. More lately the same opinion was entertained by Mulder, who, reasoning simply on the identity of composition, which he established to exist between vegetable and animal albumen, did not hesitate to conclude that the albumen of the herbivorous animals was procured from the vegetable which served them as nourishment.

"A granivorous bird finds in grain all the elements necessary for its nutrition. A dog finds in bread the matters which its organization requires for the purpose of life and of growth. A cow which is giving milk not only finds in barley and oats the matters requisite for its own existence, but also the substance by means of which the casein is formed, which is found in its milk. The cerealia ought, therefore, independent of the amylaceous or sugary matters they contain, to furnish to the animal organization the neutral azotized substances which every animal body consists of, and which we have seen that the animal body cannot create. The analysis of corn, or the flour formed of it, is quite conclusive on this point. If we take some flour, and, after forming it into a consistent paste, wash it slowly under a fine stream of water, there remains in the hand a grayish-coloured tough elastic paste, of a faint odour, which constitutes the gluten of the old chemists. The turbid water which ran off carried with it the fecula, a few flakes of gluten, and all the soluble matters. But if this liquid is left in repose, and is decanted, so as to procure it free of the fecula which is deposited, it is only necessary to boil it to recognize in it the presence of albumen. On the other hand, if we take the gluten, as it remained in the hand after the washing, four distinct substances, at least, may be recognized in it. In fact, if we boil this substance first with absolute alcohol, and then in proof spirit, we obtain a fibrous, grayish-coloured residue, which may be named vegetable fibrin. The alcoholic liquors allowed to cool furnish a substance

possessing those properties which we assign to ordinary casein. If the alcoholic liquors are then concentrated and allowed to cool, a pulqueous substance is formed, which presents all the characters of albuminous matters, but which, on account of some special properties, deserves more particularly the name of gluten. Along with this gluten is deposited a fatty matter, which is easily removed by means of ether, and which does not differ from the ordinary oils or fats, or rather from butter, which it resembles in its point of fusion.

"The analysis of the flour of the cerealia thus enables us to ascertain the presence of, 1. albumen; 2. fibrine; 3. casein; 4. gluten; 5. fatty matters; 6. fecula, dextrin, and glucose.

"We therefore regard it as proved that the food of animals includes the first four of these substances, that is to say, the azotized substances, or at least some of them. We admit that in those cases where the fecula, dextrin, and sugar disappear from the food, they are replaced by fatty matters, as we see occurs in the food of the carnivorous animals. In fine, we see that the association of neutral azotized principles with fatty, sugary, or starchy principles, constitutes the almost entire food of all herbivorous animals.

"Does it not follow from this that there are two fundamental principles in nutrition, viz. 1. That neutral azotized and organized matters are indispensable as articles of food in the nutrition of animals; and 2. That animals can, to a certain extent, subsist without taking fatty matters, or without taking starchy or saccharine principles, provided that in the one case the fatty matters shall be replaced by a proportional quantity of starch or sugar, or in the other by fatty substances?

"The indispensable necessity which all animals are under to take with their food those neutral azotized principles which exist in their organization, almost of itself demonstrates that they are incapable of creating these substances. But to render this fully apparent, it is only necessary to follow these neutral azotized principles when introduced into the stomach, and see what is their final destination. It is tolerably easy to prove that these substances are found essentially represented by the urea, which, in man and the higher animals, constitutes the essential principle of the urine, and by the uric acids in birds and reptiles, a substance which takes the place of the urea in them. Without counting the excrements, an adult man absorbs daily a quantity of neutral azotized matter capable of representing about four drachms of azote, a quantity which is found entire in the eight drachms of urea, which are passed with the urine voided during the twenty-four hours.

"Leaving out of question all those phenomena which pass in the interior of the organs, and considering only the balance of the ingesta and egesta, we find that a man gives out in urea nearly all the azote which he took in under the form of a neutral matter. Is it not, therefore, reasonable to conclude, that the neutral azotized matters of our food serve to procure this urea, and that the whole industry of the animal organism is limited either to the assimilation of this azotized matter, when the wants of the system require it, or to convert it into urea?"

On the Existence of Urea in Healthy Blood. By M. FRANZ SIMON. (*Annales des Sciences Naturelles*, December 1842.)—M. Simon has always been able to detect the presence of urea in the blood of patients labouring under Bright's disease. To exhibit this principle two or three ounces of blood are precipitated by means of alcohol, and when the liquid is filtered, the filtered fluid is evaporated in the vapour bath to the consistence of a syrup. Fresh alcohol is poured on this, the clear liquor removed, evaporated, and the process again repeated, till the anhydrous extract dissolves completely in alcohol without leaving any residue. It is then evaporated to dryness, dissolved in distilled water, filtered to remove the fat, and evaporated to the consistence of a syrup. A little is then put on glass, a drop

of cold nitric acid added, and it is allowed to rest till a saline crust forms. When this crust is examined by means of a microscope, the rhomboidal tabular crystals, of which the nitrate of urea is composed, are easily recognized.

By this means M. Simon has not only detected the presence of urea in the blood of cholera patients, but found also that it exists in all healthy blood; but in the healthy blood it exists in very small quantity.

Spermatozoa of the Camelidæ. By G. GULLIVER. (*Proc. Zool. Soc.*, No. 114.)—As the *Camelidæ*, like the oviparous *Vertebrata*, have oval blood corpuscles, it was interesting to ascertain the form of the spermatozoa of this ruminant family. In the dromedary I found the seminal animalcules so much like those of other Mammalia, and so nearly resembling the animalcules of the *Cervidæ*, that there was a difference only of size, the spermatozoa of the dromedary being slightly smaller than those of the deer.

MEDICAL PATHOLOGY AND THERAPEUTICS.

On the Stethoscopic Signs of Contraction of the left Auriculo-Ventricular Orifice of the Heart. By M. FAUVEL. (*Archives Générales de Médecine*, January 1843.)—The causes of the sounds of the heart being of late the subject of much debate, and the fallacy of the common belief having been exposed by M. Beau, whose opinions have not, however, been generally received, M. Fauvel endeavours to show from the symptoms attending disease, and the appearances observed on dissection, which theory is nearest the truth, and most likely to afford aid in the diagnosis of the obscure affections of the heart.

Three cases of diseases of the heart are related, in which particular attention was paid to the time at which the unnatural bruit was heard. In all of these the unnatural sound was heard pretty distinctly, and having its maximum of intensity at the level of the fifth rib to the left of the nipple. This unnatural sound commenced during the interval of silence which follows the second sound of the heart, and either ended when it begun (in the first case) or continued during all the time the first external sound was heard. In all these cases there was found constriction of the aurico-ventricular orifice of the left side of the heart, with greater or less disease of the valves.

These observations confirm those of M. Beau, and M. Fauvel is inclined to conclude, that when an anormal pre-systolic sound is heard chiefly seated over the apex of the heart, it affords strong probability that it is owing to contraction of the left auriculo-ventricular orifice.

Case of Recovery from Farcy. By M. LUDICKE. (*Medicinische Zeitung*, September 1842.)—A coachman, one of whose horses had been killed on account of glanders three months previously, but had been long attended and dressed by him, after exposure to cold, was seized with pain in the neck, difficulty of swallowing, and feverish symptoms. After a period of eight days an eruption appeared on the parotid region and the back of the hands, perfectly analogous to small-pox in their first stage. He had at the same time pains in the loins, feeling of oppression at the chest, cough, and great weakness. The eruption resembled small scattered, sometimes confluent, but hard tubercles. They were not surrounded with an areola, but by degrees became larger and filled with serosity, dried, and formed a few thin scales on their surface. This eruption was preceded by the appearance of a few isolated tubercles which did not suppurate. His complaints being at first mistaken for rheumatism, he was treated by purgatives and emollient gargles, under which the fever disappeared, but the other symptoms remained as before. The appetite, however, did not return, and his body rapidly wasted. As the eruption somewhat resembled some forms of syphilis, corrosive sublimate was administered without changing the nature of the eruption. The mercury, however, produced violent salivation,

and to check it the iodide of potassium was administered. By this time the malady had endured sixteen weeks, and then, for the first time, the fact was learned of the man having for some months attended his horse while labouring under glanders.

A few days after the hydriodate of potash was commenced the eruption began to exhibit marks of decay; the discharge from it dried up, the tubercles gradually became less, disappeared, and did not reappear. The appetite returned in about three weeks, and he made a perfect recovery.

About four months after this, on a fresh exposure to cold and wet, he experienced a relapse; the fever, pain in the neck, tubercles on the neck and hands, loss of appetite, emaciation, &c. returned. As soon as the feverish symptoms were removed by antiphlogistic remedies, the hydriodate of potash was given, and as soon as a few doses had been taken the eruption showed symptoms of fading. When the administration of this medicine was interrupted for some time a fresh eruption appeared, but rapidly yielded to the regular administration of the medicines. The patient soon after this became disgusted with the medicine, refused to take it, and, it is to be regretted, was lost sight of by M. Ludicke.

On the Epidemic Small-pox at Ioreze in 1836, and the protective power of Vaccination. By M. MILLON. (*Bulletin de l'Academie Royale de Medicine*, October 1842).—Every individual who had not been vaccinated was affected sooner or later with the small-pox; and in them the disease lasted from fifteen to twenty-five days. This difference in the duration of the disease depended on the mildness or severity of the case. It was invariably remarked that the milder the case, and the fewer the pustules, the sooner did the disease run its course; while, on the other hand, the more severe the attack, the longer was it of running its course, the longer was its duration. Many who had not previously been vaccinated were induced to be so during the prevalence of the epidemic, and the disease was invariably rendered milder in consequence.

The circumstance of having been previously vaccinated did not appear to exempt the individuals from being variously affected with varieties of the small-pox. Thus, most of those previously vaccinated had the chicken-pox eruption, a few others the varioloid eruption. It was very difficult to distinguish between the varioloid eruption and the small-pox during the first days of the disease. By the seventh or eighth day, however, the distinction was easy, as the varioloid eruption began to dry up, while the small-pox ran on to suppuration. These eruptions are, therefore, essentially the same, says M. Millon, the difference arising from the disease in the one case running its natural course, in the other being modified by vaccination, or transformed into the vaccine form. Vaccination, therefore, like inoculation, has created a new variety of small-pox. This conclusion is arrived at from comparing the appearance of the eruption after inoculation, and that after vaccination, when it assumes the varioloid form, which, he states, are not to be distinguished from each other. As inoculation with the small-pox gives no greater security than vaccination, and, besides, has the great inconvenience of keeping up and propagating a highly contagious disease, besides being every now and then attended with considerable mortality, M. Millon strongly advocates the superior advantages of vaccination, which, if it does not always preserve from attacks of small-pox, what is more essential, it always or almost always deprives it of all danger. He adds the following important fact from his own observation. When by chance a person who has been vaccinated dies during an attack of small-pox, it frequently happens that this takes place during the feverish stage, or on the first appearance of the eruption, so that there is every reason to believe the same person would have equally fallen a victim to any other feverish disorder, while in small-pox the chief mortality occurs during the suppurative stage.

Case in which an extraordinary number of Lumbrici were voided. By Dr GILLI. (*Giornale delle Scienze Medicales di Torino*, March 1842.)—A male child had always enjoyed good health till weaned at fourteen months. Shortly after this he had an attack of gastritis, followed by the formation of abscesses in the left axillary region. His illness was at the time attributed to his nurse having given him unwholesome food after his weaning. After his recovery from this attack, though otherwise in apparent good health, he continued to devour with avidity earth, chalk, and other indigestible substances. When eighteen months old he was again seized with symptoms of gastritis, for the removal of which local depletion, and other antiphlogistic means were had recourse to. Under this treatment the disease was yielding, when the abdomen again became tense and painful, and the colic pains were so violent that he threw himself from his cradle, and rolled on the floor. He had, however, an excessive craving for food, and devoured whatever was given him. His eyes were fixed, the pupils dilated, the tongue red and loaded, and the breath fetid. He had also convulsive movements of the face and limbs. Fomentations were therefore applied to the abdomen, and vermifuge remedies administered. On the first day after their employment twelve lumbrici were voided. The symptoms still continuing, the same remedies were persevered in, with the addition of an enema, which produced the discharge of a great number of worms, with manifest relief to the symptoms. As the same symptoms continued, though in a milder form, the vermifuge remedies were persevered in, and within eight days no fewer than 510 lumbrici were discharged either alive or dead, most of them being about six inches in length. Some of these worms were vomited, but by far the greater number were discharged by stool. At the end of eight days no more worms were passed, all symptoms of irritation disappeared, and the child perfectly recovered.

On the treatment of Acute Rheumatism by large doses of Quinine. By M. BRIQUET. (*Bulletin de l'Academie Royale de Medecine*, November 1842.)—M. Briquet was induced to try the effect of large doses of quinine in acute rheumatism, in consequence of having observed its curative powers in typhoid fevers. Of nine cases treated in this way all were cured, the treatment lasting from six to seven days. From seventy-five to ninety grains of the sulphate of quinine were dissolved in an acidulated liquid, and administered by table spoonfuls every hour, so that the whole quantity was taken within the twelve hours of the day. This quantity was given only for two days, after which the dose was diminished to fifteen or thirty grains a-day.

After twenty-four hours of this treatment, the feverish symptoms had almost completely disappeared; the pain, swelling, and redness of the joints had also notably diminished. After forty-eight hours the feverish symptoms had quite disappeared, and the swelling and pain were still further abated. After four days the swelling and pain had completely left, and the parts affected with the rheumatism could be moved freely.

In three of the cases slight rheumatic pains, and swellings of other joints than those first affected were experienced on the fifth and sixth days, but the continuance of the same remedy served to remove them completely. In four of the cases symptoms of pericarditis and endocarditis were present.

No permanent bad effects seemed to follow the large dose of quinine. All experienced more or less ringing in the ears, vertigo, transient dimness of vision, efforts at vomiting after the spoonful of dissolved quinine, or a passing diarrhoea. By the fifth day, however, all were able to eat solid food. M. Briquet states that he is now satisfied quinine in large doses possesses as much power over the acute rheumatism as it does in small doses over the intermittent fevers.

M. de Lens, at a subsequent meeting of the academy, bore testimony to

the curative effects of quinine in rheumatism, which, he said, he had employed for that purpose for some years past, and made known to the Medical Society of Paris, and also to the academy at former meetings.

Jaundice Epidemic at Chasselay in 1841. By Dr CHARDON. (*Bulletin de l'Academie Royale de Medecine*, November 1842.)—After some days of thick foggy weather in the month of October 1841, a considerable number of the inhabitants of Chasselay were affected with jaundice. Most of them complained of general uneasiness, with anorexia, and sensation of weight, and oppression in the precordial region. Acute pains were often experienced in the epigastric and right hypochondriac regions. After this the body became tinged of a yellow jaundiced colour, accompanied in some with disordered digestive functions, but no fever, but in others with no apparent disturbance of the general health, the yellow colour and bloated appearance of the skin being the only symptoms indicative of the presence of disease. The alvine evacuations were of a gray colour in all, and the urine was tinged with the colouring matters of the bile. Old and young were alike seized with the epidemic complaint, but none fell victims to it. The epidemic ceased of itself after three months.

The complaint was easily removed by leeching the epigastric and hypochondriac regions, applying emollient liniments, keeping the abdomen warm by cotton bandages, and administering internally seidlitz water, and mucilaginous drinks.

Assafœtida, a cure for Hooping-cough. By M. REIKEN. (*Journal des Connaissances Medico-Chirurgicales*, July 1842.)—M. Reiken has found assafœtida more useful in removing hooping-cough than any other remedy he employed. In order to insure success it was found necessary to delay its administration till the feverish stage had passed. He chiefly administered it in clysters, as children object to taking it by the mouth. One-half grain of assafœtida with a yolk of an egg were dissolved in six or eight ounces of water, which quantity formed ten or twelve clysters for children under one year, four or six for those under three years, and two or three for those older than that. Two clysters were administered daily. If the remedy excited diarrhœa the quantity of the yolk of egg was increased, and tenesmus was allayed by adding olive oil. He sometimes employed the remedy externally by mixing it with lard.

New Antidote for Corrosive Sublimate. By M. MIALHE. (*Bulletin de l'Academie Royale de Medecine*, October 1842.)—In a note to the academy M. Mialhe states that he has found the hydrated proto-sulphuret of iron possesses the valuable property of decomposing instantly corrosive sublimate; the result of decomposition being a proto-chloride of iron, and a bisulphuret of mercury, two harmless preparations. The hydrated proto-sulphuret of iron is besides perfectly innocuous. The details of his experiments have not yet been communicated to the academy, but he states in proof of his assertion, that if a grain of corrosive sublimate be laid on the tongue, the insupportable metallic taste is removed, as by enchantment, if the mouth be freely gargled with water holding the proto-sulphuret of iron in suspension.

In a future paper he purposes to show its use in cases of poisoning with several preparations of copper and lead, which it decomposes and renders innocuous in a similar manner.

Case of confluent Small-Pox in a new-born child. By M. GERARDIN. (*Bulletin de l'Academie Royale de Medecine*, January 1842.)—M. Gerardin exhibited a child to the meeting of the Academy, born five days previously with a full eruption of confluent small-pox in a state of suppura-

tion. The mother was healthy and had no complaint. About eight or ten days before her confinement she had visited a friend in the Hospital of La Pitie, near whom lay a person affected with small-pox. She herself suffered nothing in consequence of this visit, but the foetus *in utero* had apparently been affected with the disease in consequence.

Report of the Results of Inoculation in Measles. By M. VON KATONA of Borsoder in Hungary. (*Oesterrichische Medicinische Wochenschrift*, July 1842.)—In a very malignant and wide-spreading epidemic of measles during the winter of 1841, M. Von Katona inoculated 1122 persons with a drop of fluid from a vesicle, or with a drop of the tears from a patient labouring under that disease. The operation was performed in the same manner as the inoculation for small-pox. It failed in seven per cent. of those on whom it was tried; but in all the rest produced the disease in a very mild form, from which not one died. The puncture was generally immediately surrounded with a red areola, which, however, soon disappeared. On the seventh day fever set in with the usual attendant premonitory symptoms of measles. On the ninth or tenth day the eruption appeared. On the fourteenth desquamation commenced, with decrease of the fever and eruption; and by the seventeenth the patients were in general well again.

Endermic mode of administering Quinine. By Dr GUASTAMACCHIA. (*Il Filiale Sebezio*, August 1841.)—Quinine being often rejected by patients on account of its bitter taste, Dr Guastamacchia endeavoured to find out some equally successful mode of administering it. After repeated trials he found it acted equally efficaciously if applied externally. He dissolved eight grains of the sulphate of quinine in half an ounce of rectified spirit of wine, and rubbed first the one-half, and after the interval of a quarter of an hour the other half, along the spine. When this was done in intermittent fever at the beginning of the cold fit, it very often prevented even a single recurrence of it.

Quinine in Asthma. By B. R. HOGAN, Esq. (*American Medical Intelligencer*, February 1842.)—Mr Hogan was induced to try the effect of doses of quinine in asthma, from its known efficacy in all paroxysmal and congestive diseases. It surpassed his most sanguine expectations, curing every case in which he had an opportunity of administering it. He gave from two to eight grains in one dose, and repeated it in an hour if relief did not follow.

SURGERY.

Successful transplantation of a sheep's tooth into the Socket of one of the Incisors of a Child. By ROBERT TWISS, Esq. (*Dublin Journal of Medical Science*, September 1842.)—On the 24th of April 1841, having extracted the remainder of a broken incisor tooth from a girl twelve years of age, Mr Twiss put in its place the front tooth of a yearling sheep, "reeking from the jaw of the living animal," after having shortened its root about a-quarter of an inch. Though the tooth was too small for the space, and the girl did not attend to the directions given, it gradually became more firm, and presented every indication of having taken root. It is stated that when measured lately it was found actually enlarged, but not to the same extent as it would have been had it remained in its original situation.

Mr Twiss was led to select sheep on account of the extreme cleanliness of the animal, and the beauty and aptitude of the teeth for this purpose. He recommends that teeth be taken only from sheep two or three years old, as at that age they are about the size of adult human teeth, and are more likely to grow when transplanted. The root may be shortened, or pared

if necessary, to make it fit its new situation, and the tooth held *in situ* by waxed silk ligatures.

On the Treatment of Small Nævi in children with the Acetum Lithargyri. By Dr SIGMUND. (*Oesterrichische Medicinische Wochenschrift*, May 1842.)—Dr Sigmund states, that after the employment of a variety of remedies, he found the *Acetum Lithargyri* the most powerful in causing to shrink and disappear those vascular growths in children known by the name of nævi, when the size did not exceed that of a hazel-nut. For small non-pulsating tumours of this kind the *Acetum Lithargyri* is applied as a cold fomentation, or by means of small compresses, dipped in the solution and renewed twice a day. It caused a separation of the cuticle, which cracked and fell off, when the exposed cutis was treated in the same way. In four weeks the cure was generally completed.

Case of Luxation of the Odontoid process of the second cervical Vertebra. By M. SEDILLOT. (*Gazette Medicale de Paris*, 3d November 1842.)—A girl, 21 years of age, in the beginning of 1841, was seized with a stiff neck, which she attributed to cold. The head was continually twisted to the left, but she possessed the power of moving it in the opposite direction. In the beginning of February a man seized her by the head, and violently twisted it to the side, on which she felt a violent pain at the back of the neck, lost the power of turning the head to the right side, and experienced a difficulty in swallowing. A hard and insensible tumour appeared at the back part of the neck, and continued to increase in size. About the 15th of March, the urine was passed with difficulty, she slept none, and the motion of the left arm became weakened, as well as those of the fingers of the right hand. The face was turned to the left, and looked downwards; the least movement of the head was painful, and produced excessive dread. The difficult deglutition often excited cough; and the bowels were constipated. When lying without motion she felt no pain, excepting occasional darting pains at the back part of the head, towards the tumour, which was about the size of a walnut, and was in the situation of the spinous process of the higher cervical vertebræ. She died from the increase of the paralytic affection.

On dissection the odontoid ligament was found broken and destroyed without any traces of suppuration. The odontoid process of the axis was slightly roughened anteriorly, but otherwise healthy, as was also the *atlas* and *axis vertebræ*. The odontoid process compressed the anterior columns of the spinal marrow, which were softened, and had a bruised look; the posterior columns appeared, however, to be almost untouched. It is worthy of note, that during life the power of motion was lost to a much greater extent than that of sensation.

Keratoplastie, or Transplantation of the transparent Cornea. By MM. FELDMANN and DAVIS. (*Comptes Rendus des Seances de l'Academie Royale des Sciences*, 31st October 1842.)—MM. Feldmann and Davis of Munich have made numerous experiments on transplanting the transparent cornea, of which the following is the result: If, after having completely detached the transparent cornea from the eye of an animal, it be replaced, and be held in its position by several points of suture, it contracts new adhesions in all its circumference. The same occurs if the transparent cornea be removed from the eye of one animal, and be transplanted to that of another, even though the animal be of a different species. The success of this sort of grafting appears to be more complete when the eye to which the cornea is transferred has lost its crystalline lens. In these experiments a certain amount of transparency of the cornea was retained. M. Feldmann ascertained that injections pass without difficulty from the one to the other part of the united parts.

Case of Congenital Cervico-pharyngeal Fistula. By M. HYRTL. (*Archives Générales de Médecine*, December 1842.)—A man, 35 years of age; consulted M. Hyrtl on the propriety of undergoing an operation for a fistulous opening in his neck. When about 15 years of age he noticed that his collar and cravat, opposite the left side of his neck, were constantly stained, and occasionally adhered by an adhesive matter to his neck. He traced this to the existence of a small opening, with sunk red margins, from which could be expressed a drop of mucus. This opening was placed about an inch and a-half above the sterno-clavicular articulation on the inner margin of the sterno-cleido-mastoid muscle; it was about the size of a large pin's head, and when the person swallowed anything, was drawn inwards, so as to present an infundibuliform appearance. This circumstance led to the belief that the opening communicated with the cavity of the pharynx, and a probe of Anel introduced into it penetrated to the pharynx, excited cough and tickling sensation in the throat. When the mouth was opened, and the tongue depressed, the point of the probe could be seen in the throat, but the exact site of the internal opening could not be seen, as it was concealed by the base of the tongue. Liquids which were swallowed never escaped by the fistulous opening; but liquids injected through the opening from without fell into the pharynx, and were swallowed. No operation was performed.

M. Hyrtl considered the fistulous opening as congenital; that, in fact, it was one of the branchial clefts or openings of the fœtus which had remained open. He attributes the circumstance of its not being noticed till the fifteenth year to the fact of the larynx at that period of life undergoing a further development, when this opening, till then latent, enlarged with it and became visible.

MATERIA MEDICA.

On the solution of Citrate of Iron or Aqua Chalybeata. (Dublin 1843.)—Our attention has been directed to a new preparation of iron in solution, which we think so pleasant and elegant a form of administering that mineral, that we believe it cannot be too generally known.

It is unnecessary to enumerate all the forms employed in giving this mineral, or to specify and consider the objections which have been brought against each. It is sufficient to say, that the sulphate, the saccharine carbonate, and the muriate in tincture are the forms most usually adopted for its administration. Each has peculiar advantages in particular disorders; and all have disadvantages. Indeed, it may be said that all taking of iron is injurious; and were it not that it is found so powerful in removing certain morbid states of the system, especially in females, it would be best to refrain from its use.

The *Aqua chalybeata* has the great advantage of being decidedly the most agreeable and pleasant form of taking this substance hitherto proposed. It is contained in small bottles, well-corked, and when drawn effervesces most briskly and pleasantly like champagne. It is of a light straw-colour, perfectly transparent, and the taste of the iron, though perceptible, is very successfully concealed. It is recommended by the following circumstances:

1. It possesses a definite and uniform constitution, and may be kept in a cool place uninjured for years.
2. It not only holds the iron in perfect solution, but in a state of combination, from which the oxide of iron is not liable to be precipitated in the stomach, by the presence of acids or alkalies. It is therefore readily and quickly taken up by the absorbents.
3. Being an organic saline solution of iron, its action is peculiarly mild. It does not derange the stomach, and not being characterized by astringency, it does not produce the constipation of the bowels, which so frequently results from the administration of the sulphate and chloride.
4. It is more agreeable to the taste than the other preparations of iron,

and being combined with the grateful aromatic of the orange rind, it will be taken freely, and with pleasure, by patients who are often with difficulty persuaded to swallow such nauseous draughts as the *Mist. Ferri Aromat. Mist. Ferri Comp., &c.*

5. Being highly impregnated with carbonic acid, the salutary tonic properties of this gas are combined with those of the iron. The preparation is thereby rendered peculiarly grateful to the stomach, and, like the waters of chalybeate springs, is found to agree well with the digestive organs when other chalybeates cannot be borne.

Each bottle contains six ounces of chalybeate water, and holds in solution thirteen grains of citrate of iron. It contains, therefore, the same proportion of base, that is, the same quantity of iron, as six ounces of the *Mist. Ferri Comp. Ph. L. E.*, and D. and may be regarded as being of the same strength as that well known preparation. As it is found to agree well with the system, a wineglassful may be considered the ordinary dose for an adult, and may be taken twice or thrice daily; but, from the nature of chalybeates, it is obvious the medical practitioner must be guided by experience in varying the dose, according to the age, sex, temperament, or state of the patient.

It may be given in all states of the same disorders in which the use of iron is indicated, as anæmia, chlorosis, neuralgia, amenorrhœa, dyspeptic disorders, and general weakness.

This preparation we have given in several cases of chlorosis and amenorrhœa with great benefit. We do not pretend to say that it is more powerful or efficacious than either the sulphate or the tincture of the muriate; but it is greatly more agreeable to take, and can be longer taken by patients, than either of these forms,—an advantage, we believe, of great moment. It seemed often to increase the vigour of the appetite, and to act as a smart diuretic. We think that in some of the forms of dropsy, and especially in that of renal dropsy, under certain circumstances, it might be administered with beneficial effects.

The only objection to this medicine is, that it is too expensive for very general use. But to the opulent it must be allowed to be a very great acquisition.

OBSTETRICS.

Extraordinary case of Twins. By Dr JAMESON. (*Dublin Journal of Medical Science*, September 1842.)—A lady, 30 years of age, was delivered of a male child at the full period, on the 13th February, and made a good recovery, only was astonished that her size had not much decreased. Her general health remained good; the milk was secreted as on former occasions, and she nursed her child. On the 3d of April, or seven weeks after the birth of her child, pains resembling those of labour again came on, for which Dr Jameson was called, who recognized an uterine tumour, with indistinct placental murmur, but no pulsations of foetal heart. The pains rapidly became more severe, and a dead six months' ovum was expelled with the membranes and placenta entire. The body of the child was dark and shrivelled, about nine inches long, but not at all putrid or decomposed. She had been attended by a midwife on the last occasion.

It is remarked, that the interesting points of this case are the circumstance of this child having been retained forty-nine weeks within the uterus, or within three weeks of twelve months after the last act of menstruation; the being retained for such a period of time after its growth was arrested without being decomposed; the labour pains ceasing after the delivery of the living child; and no hemorrhage occurring from the site of the placenta of the living child.

MISCELLANEOUS.

Use of Cocculus Indicus. (*From Annals of Chymistry*, p. 417, No. 13, Vol. I.)—To the Editors of the *Annals of Chymistry and Pharmacy*.—In last number, p. 232, we inserted a short notice of the large quantity of

Cocculus sold and used in the manufacture of malt liquors in London. Since that time the following additional notice on the subject has appeared in the same Journal. GENTLEMEN,—In reply to the communication of Medicus in your last, I take leave to offer a few observations on the Cocculus Indicus.

Although I have carefully looked over the returns of imports every year, I have never been able to discover for some time past any notice of the quantity of the drug annually imported. Dr Pereira in his *Materia Medica*, states that he found, from a druggist's private books only, 2500 bags were entered in the year 1834; but this information is indefinite, as the weight of each bag is not stated. In 1832, the importation was 12,000 lbs. Of this there is a small quantity used by poachers, and to destroy vermin; by far the greater part being required for adulterating beer. This is no secret. A writer on brewing, a Mr Childe, states that with pure malt and hops it is impossible to produce a strong-bodied porter, and, therefore, he recommends the use of Cocculus Indicus, Grains of Paradise, and Nux Vomica. Another author—Morrice, (*Treatise on Brewing*)—gives full directions for its use. He directs three pounds of Cocculus Indicus to be added to every ten quarters of malt; and he adds, "it gives an inebriating quality which passes for strength of liquor; and it prevents second fermentation in bottled beer, and, consequently, the bursting of the bottles in warm climates.

Notwithstanding the use of this drug being prohibited under a penalty of L.200 upon the brewer, and L.500 upon the seller, it is still very extensively employed; but, in order to preclude the possibility of detection, the brewer's druggists sell a watery extract of it under the title of *black extract*. This black extract is ostensibly prepared for tanners; but its real object is for the adulteration of beer.

I doubt not that your correspondent Medicus is aware that, in addition to this, a vast number of other drugs are likewise employed in brewing. So long back as 1814, Accum gave a long list of these sophistications in his "*Treatise on the Adulterations of Food*."—Yours obediently, G. T. F.

Dec. 19, 1842.

Harveian Society.—Notice to Students of Medicine.—The Harveian Society of Edinburgh have fixed on the following subject for their Prize Essay for the year 1844, viz :—

"An Experimental Inquiry into the Changes produced by Disease on the Sensible Qualities of the Blood, and the Relative Proportions of its Organic Constituents."

Dissertations on this subject must be transmitted to one of the Secretaries, on or before the 1st day of January 1844. Each dissertation must be accompanied by a sealed letter, containing the name and address of the author, and inscribed on the back with a motto. The same motto must also be prefixed to the dissertation to which the letter belongs. None of the sealed letters are ever opened, except that bearing the same motto with the successful essay.

The prize given by the society to the successful candidate is an elegant silver medal, with a suitable inscription.

The candidate is at liberty to employ his essay afterwards, in any way he may think proper: And, accordingly, some dissertations submitted to the Harveian Society, have, in consequence of publication, conferred no small degree of reputation on the authors.

No candidate, who has already gained the society's prize, is allowed to compete a second time.

By order of the Society,

RICHARD HUIE. M. D., 8 George Square, }
P. D. HANDYSIDE, M. D., 45 York Place, } *Secretaries.*

Edinburgh, March 11, 1843.

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END OF VOLUME FIFTY-NINTH.

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